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Table of CONTENTS

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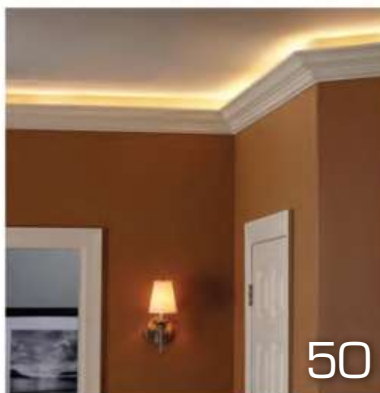
38



19



32



50

FEATURES

19 Kitchen shelf

Easy to build, easy to customize.
Great for the kitchen—or anywhere!

32 **Go to the Pro:** Elegant outdoor finish

A “spar” finish gives outdoor wood that glossy glow, plus protection from sun and rain.

38 Stone accent wall

Cover a wall with simple stone veneer and transform a room in a weekend.

50 Cove lighting

This soft, elegant lighting can enliven any living space.

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Handy Hints and
Tiling a Backsplash.
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Table of CONTENTS

OCTOBER 2015

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DEPARTMENTS

5 Stuff We Love

Toe-saving footwear, a collapsible tool cart, moldable glue and so much more.

12 Handy Hints®

Clever ideas for overhead storage, dispensing glue and checking trailer lights.

48 What Every Homeowner Must Know

Tips for better fence planning, toilet shopping and floor protection.



60 Home Care + Repair

We show you how to replace a plumbing shutoff valve—before it fails.

64 Top Ten Tips

Your guide to a perfect, long-lasting exterior caulking job.

68 Car + Garage

How to get the best deal on a new vehicle, even if you don't like to drive a hard bargain.

72 Pro Tips

Rough-in wiring advice to help you get the job done right the first time.

77 Pro Talk

Tips for using reclaimed wood, job-site smarts and big boots for big accidents.

78 DIY Quiz

Think you're a smart homeowner? See if you can ace this test.

92 Great Goofs®

Water-bed misery, a doghouse dilemma and a non-dimmable vacuum.



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STUFF we love

BY MARK PETERSEN

editors@thefamilyhandyman.com

DIY WORK WEAR

We're keen on Keens

It turns out that half the staff here at *TFH* own and love a pair of Keen footwear. The Keen Company started out making airy, comfortable sandals with a rubber protective toe. The distinctive (some would say goofy looking) Newport sandal was born, and it became an instant success.

Keen now makes a wide range of shoes and boots, including durable work shoes perfect for folks on their feet all day like medical staff and service industry workers. A steel toe is also an option for people in warehouse and industrial settings. Keens are not the cheapest, nor perhaps the prettiest, shoes, but they sure are comfy. Go to keenfootwear.com to find a retailer near you.

Studios are always cluttered with light stands, extension cords and power packs. The rubber toe provides great protection from the inevitable bump or stumble. These shoes also make standing on a concrete floor all day a lot more tolerable.

Tom Fenenga, Photographer

I have a love-hate relationship with my Keen sandals. They've seen me through marshes, pebbled rapids and rocky portages. I love them for their sturdiness, but I hate that I can't buy a new pair because they don't wear out!

Marcia Roepke, Art Director

My Keens look just like Charlie Brown shoes. Good grief! But they are uber comfortable, and my middle name is Charles, so what the heck.

**Mark Petersen,
Associate Editor**

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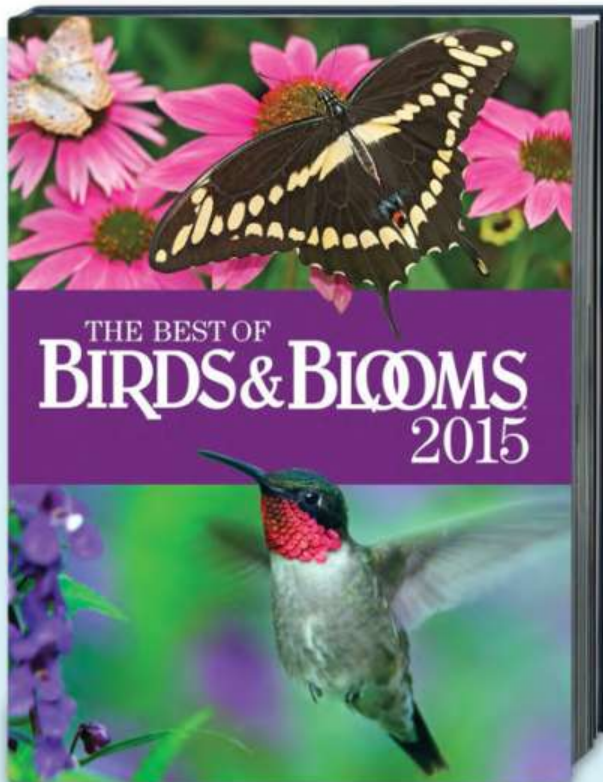
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Space-saving cart

A rolling cart is a super-handly workstation for all sorts of tasks. You can pile on parts and tools for repairing or detailing a car in the driveway, or keep gear organized during a painting project. The problem is that carts take up a lot of room between tasks and tend to get filled up with other stuff. They're not easy to transport either.

Olympia Tools makes a sturdy collapsible cart that has none of those drawbacks. It's easy to carry when folded up and can be hung on the wall when not in use. It measures about 26 x 15 x 34 in. and folds down to about 8 x 15 x 42 in. Buy the Collapsible Service Cart (model 85-188) at one of several online retailers for about \$90.

Mark Petersen, Associate Editor



PRO TOOLS + GEAR

Shop smarter with your smartphone

Hey, contractors. The Home Depot has a cool app for your smartphone. It allows you to buy material and supplies on your phone right at the job site, so you don't have to worry about sending "the new guy" to the store with your credit card.

Every purchase gets assigned to whatever job you wish—no more sorting through piles of receipts at the end of the month. And no more wasted trips to the store because it will let you know what's in stock at whichever Home Depot store you chose. It even displays a map of the aisles and shows where to find the stuff on your list. It's easy to use and costs nothing. Search "Home Depot Pro App" at youtube.com and check out the demo video.

Bluetooth headphones

Protective headphones equipped with a radio have been around for a while. Some models offer an auxiliary jack so you can plug in your phone or MP3 player, but good luck keeping that irritating cord plugged in for more than five minutes at a time.

ION has solved that little problem with its Tough Sounds Hearing Protection Headphones with Bluetooth & Radio. Now, while mowing the lawn or running a chain saw, you can tap into your Bluetooth-equipped device and listen to your own tunes or a podcast. These headphones have a built-in rechargeable battery that lasts up to 20 hours per charge. Buy a pair for \$79 at northerntool.com. Search for "Bluetooth headphones."



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Vehicle-washing wand

My family owns a cabin on a river, and that means boats, canoes and trailers that all need regular washing. Hyde Tools' PivotPro Water Wand for Boat & Auto is the perfect tool for the job. It has an adjustable brush head and a jet that you can aim from the handle end. A soap dispenser completes the package.

The 46-in. length gives you plenty of reach. I liked being able to wash underneath our boat and inside the wheel wells on the trailer without stooping. Get a PivotPro Water Wand for Boat & Auto from Amazon for \$45. The \$65 kit version includes a soft brush, a micro-fiber pad and a spindle brush for cleaning wheel rims.

Ken Collier, Editor in Chief



Good-bye, funnels

Sure, a funnel works great at keeping fluids from spilling all over, but when you're done pouring and pull it out of the hole, the fluid leftover in the funnel drips all over the place. I use this Hopkins FloTool On-Off Refill Spout (No. 10101) to keep that from happening. I have one on my windshield washer fluid and antifreeze containers and one on my gallon jug of chain saw bar oil. There's no mess and no cap to fumble around with—just twist and pour.

Hopkins FloTool also makes a Spill Saver Oil Spout (No. 10107) that fits quarts of oil. I'm not sure I know where my funnels are anymore. Buy the On-Off Refill Spout online for \$6 or the oil spout for \$7.

Mark Petersen, Associate Editor



DIY University

These days you can find courses online on just about anything from the microeconomics of Mongolia to how to truss a turkey. And now, with DIY University from *The Family Handyman*, you can learn to be a great DIYer.

We've got courses on electrical skills and projects, toilet repairs, trim and much more. Some of the courses are advanced and technical; some are designed for new homeowners just getting started in DIY. You can learn at your own pace in the comfort of your home, and the course is yours forever, so it's a great reference tool.

So check them out, for yourself or as a gift. There are free courses for you to sample. Prices for the rest are \$6 and up. Go to mydiyuniversity.com.

Ken Collier, Editor in Chief



Moldable glue

I have two sets of chargers for all my electronics and always keep one set at work. That way I don't have to climb under my desk to unplug a cord when I want to go mobile. I just discovered this Sugru product, which works great for securing my collection of cords so they don't fall on the floor every time I take home my laptop or tablet. It can also be used to repair frayed cords, or add protective bumpers to a phone or camera.

Sugru feels like Play-Doh when first removed from the package but cures into a silicone rubber that adheres to a variety of surfaces. A three-pack will cost you about \$12 at home centers and some discount stores. Find out about more uses for Sugru at sugru.com.

Vern Johnson, Art Director

Handy HINTS®

FROM OUR READERS

handyhints@thefamilyhandyman.com

EDITOR DAVID RADTKE • ART DIRECTION MARCIA ROEPKE • PHOTOGRAPHY HSP



NO KINKS, NO DAMAGE

Several years ago, I noticed my neighbor pressure-washing her driveway. The hose was “dancing” all over the concrete from the pulses generated by the pump, and as a result, it was almost worn through in several spots. To preserve the hose on my pressure washer, I went to the auto supply store and bought some inexpensive black split-wire loom. It slips over the high-pressure hose quite nicely, and it protects the hose from wear. Plus, it prevents kinking, the most common cause of hose damage.

William R. Law



Mustard bottle for glue

I no longer put up with the messy “overdesigned” carpenter’s glue dispensers. Instead, I use old mustard bottles; they don’t clog and they easily reseal between uses.



Richard Painter



Smoother caulk

I used to cut caulk tube nozzles at an angle to get a nice bead in corners. The problem was, when I had to switch direction while caulking, the cut edge was in the wrong place to continue the bead. My solution is to cut the nozzle straight and then round it smooth on all sides with an abrasive pad or a nylon carpet scrap. Just rub the cut edge for a minute or so until it's smooth. Now you can caulk in any direction with a nice, continuous bead. Give it a try!

Brian Flynn



Overhead storage space

The space between the floor joists in my unfinished basement is the perfect spot to store leftover trim and boards. I bought some chain, S-hooks and eye screws and made some corrals to hold the stuff in place. It's easy now to see my inventory and slip a piece out or remove the chain to sort through the entire bundle.

Les Beekman

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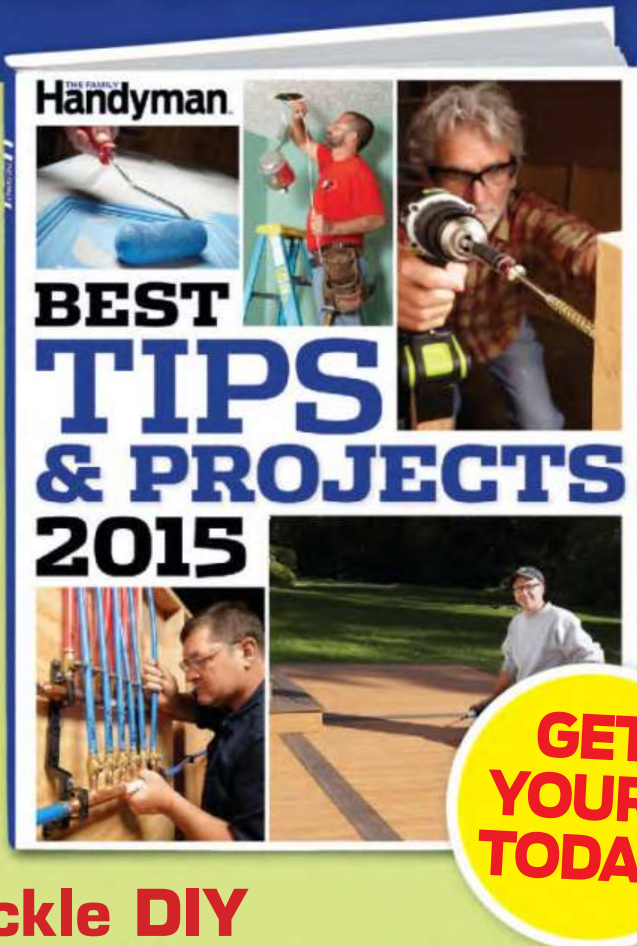


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ASSEMBLY AID

I was assembling some plywood storage boxes and needed a third hand to hold the parts square while I screwed them together. I found an old 4-in. electrical box in the garage and decided to give it a try. The box was sturdy and perfectly square, and the clamps fit nicely inside to hold the assembly tight while I drilled pilot holes and drove screws.

Steve Rodgers



Wrench within reach

When I change blades on my band saw, I usually need to adjust the thrust bearings and guides with an Allen wrench. I was tired of hunting around for the wrench, so I decided to stick it to the steel housing with a rare earth magnet (neodymium) about the size of a jacket button. Now it's always handy!

Bill Wells



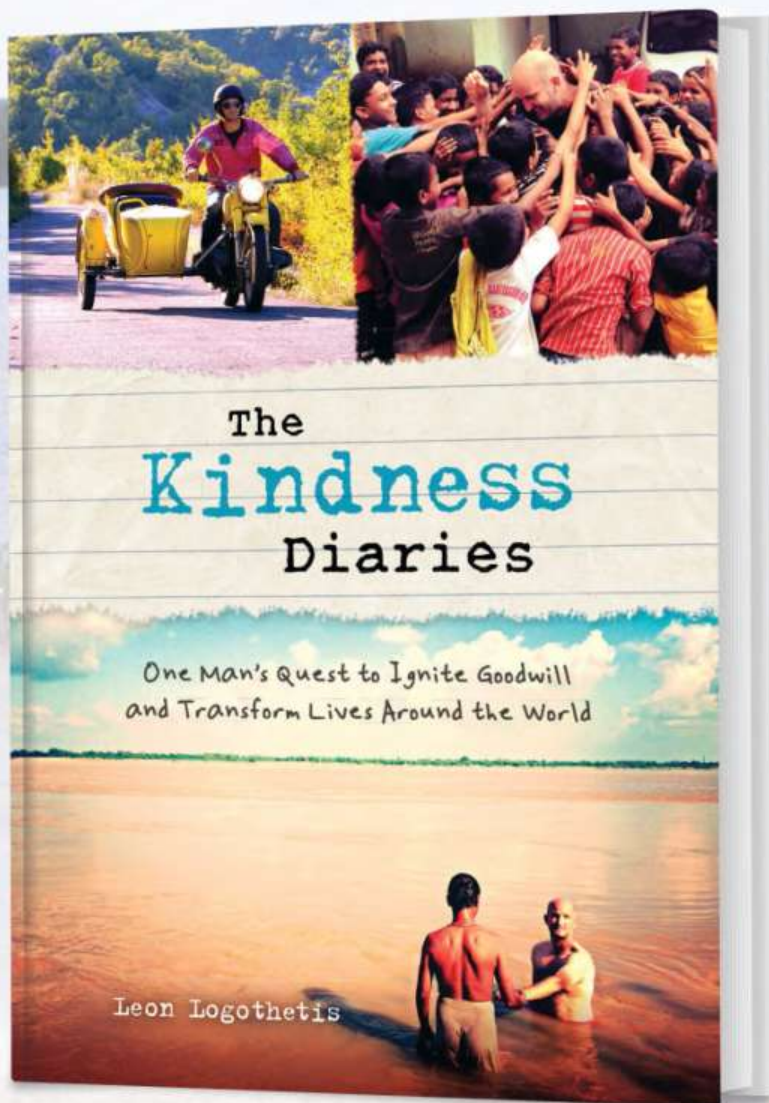
Light-check assistant

Whenever I hook up the trailer, I need to test the trailer lights. Trouble is, I can't press the brake pedal and view the lights at the same time. So I just clamp a stick to my steering wheel to hold the pedal down while I walk behind the trailer. I store the stick and clamp in the trunk (or behind the seat) for the next time I do my hookup.

Les Beekman



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SIMPLE KITCHEN SHELF



by Ken Collier

editors@thefamilyhandyman.com

Easy for anyone to build—and fun to customize!

Lots of kitchens have a little wall space that would be perfect for a storage or display shelf. Plenty of bathrooms do too. When I was a cabinetmaker, I built shelves like this for customers, and I liked them so much that I built a fleet of them for my own home. However, those shelves were made with an

arsenal of high-powered woodworking tools. This time, I wanted to design a shelf that anyone with basic tools could build. This shelf is a great project for a beginning woodworker, and since it's so easy to adapt to different uses, a more advanced DIYer can have a lot of fun customizing it.

Tools and wood

You'll need a jigsaw, a drill and two accessories for the drill. The first is a No. 8 combination drill bit and countersink (shown at right), which you can find for \$5 anywhere drill bits are sold. The second accessory is a small sanding drum (shown at right and in **Photo 3**), which you can find at home centers or online for about \$12. The one I used is made by Vermont American. The only other tool you might need is a nail set, for setting the heads of finish nails below the surface. Obviously, if you have a band saw and a miter saw, they will make this project a piece of cake.

You can build this shelf from just about any type of wood. Resist the urge to use the least expensive knotty pine, unless that's the look you're after. Knotty pine will be harder to work with and to paint well. Instead, get clear pine, poplar or any other knot-free board. If you're planning to paint the shelf, avoid oak. I used alder from The Home Depot.

Cut out the shelf and brackets

Begin by cutting the shelf to length with a jigsaw (**Photo 1**). Then cut a piece 6 in. long from which you can cut the two brackets (**Photo 2**). Jigsaws often make a rougher cut on the top surface, so label that "top." The roughness will be hidden by the edging, even if the top of the shelf is visible after hanging it. But use a fine-tooth blade and set your oscillating feature (if your saw has it) to zero.

You can trace the curve for the brackets from the full-size pattern on p. 22, or even easier, use the bottom of a coffee can or a small plate. The exact curve isn't important. After the brackets are cut, smooth the sawn edges with a file, sanding block and the sanding drum in your drill (**Photo 3**) until the wood is smooth. You can stop sanding at about 150 or 180 grit.

Install edging strips on the shelf

Start edging the shelf by cutting the end strips to length. Instead of measuring, just hold the molding to the end of the shelf and mark it for cutting. It won't hurt if it's a hair too long. Mark one edge of the shelf as the front edge, then nail on the side strips (**Photo 4**), keeping the front edge



Low-tech woodworking

This is a low-tech project. A jigsaw and a cordless drill are the only power tools you need, though there are more accurate and faster options. You'll also need some basic hand tools and two specialized accessories for the drill: a sanding drum and a combination drill/countersink bit. (See the text for more info.)



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MEET THE EXPERT

Ken Collier, a former cabinetmaker and custom woodworker, has been working wood for 40 years. He's built everything from coat hooks to kitchens, and dozens of different shelves. He's also the Editor in Chief of *The Family Handyman*.



1 CUT THE SHELF TO LENGTH

Use a fresh blade and a square to guide your cut. A miter saw is the best tool for the job, but if you don't have access to one, you can substitute almost any other saw.



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Figure A
Exploded view of shelf

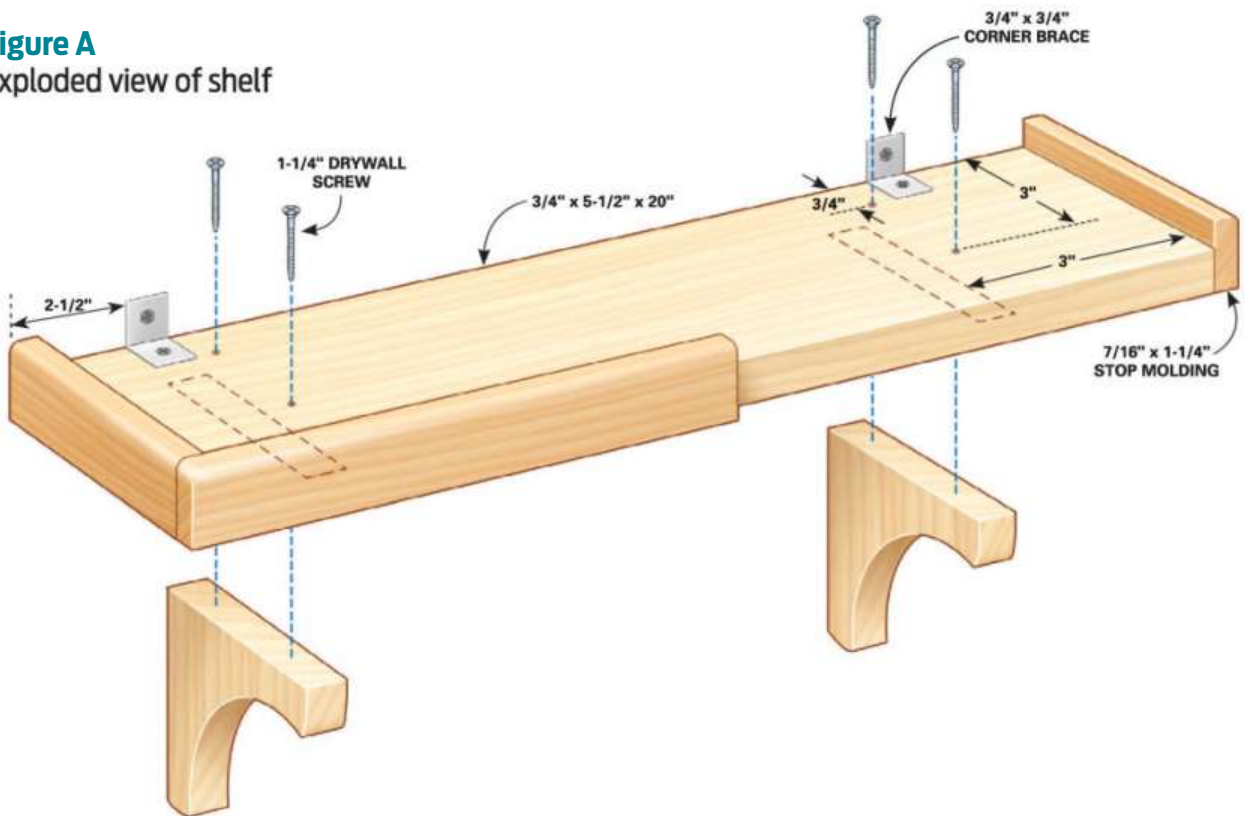
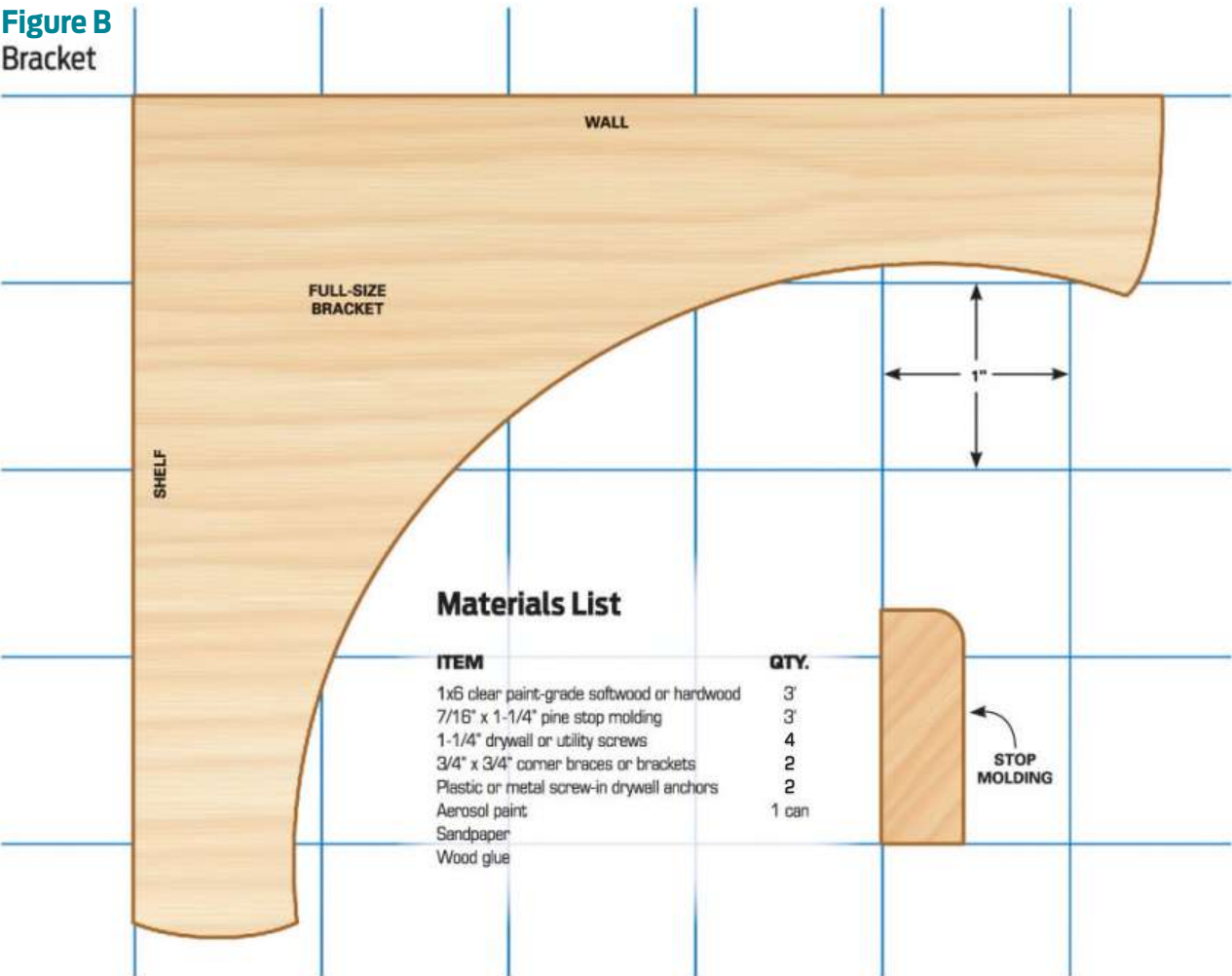


Figure B
Bracket



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flush. Make sure the rounded edge faces out. Put a thin bead of glue on the shelf edge before nailing, and keep the bottom edge as flush as you can. If the strips are a little long in back, you can easily sand or file off the excess, and if they stick out a little on the bottom edge, that can be sanded off too. Finally, nail on the edging strip in front.

Now set the nails and put a little painter's putty on them. When the putty is dry, sand the edging so the corners are smooth and the bottom edge is flush with the shelf. The bottom of the shelf will have a seam between the shelf and the edging. It's pretty much impossible to eliminate that seam permanently. Expansion and contraction of the wood will open it up even if you caulk or putty it, so don't be too much of a perfectionist. However, if your cut on the 1x6 is particularly rough, some putty there will help clean things up.

Screw the brackets to the shelf

The next step is to drill some screw holes in the shelf for attaching the brackets. The idea is simple: two screw holes on each side of the shelf so you can screw down into the brackets. Here's what to do. First, hold a bracket where you want it to be, but on the top of the shelf. Trace around the bracket, then do the same thing for the other bracket. Mark the screw locations and drill screw holes in the shelf from the top, using your combination drill/countersink bit.

Now hold a bracket in position on the bottom of the shelf, make sure the back edge is flush with the back edge of the shelf and that the screw holes are centered on the bracket. You can do it by eye, but if that's hard, put the two screws in their holes and use the points of the screws to guide you. Drive the screws by hand into the bracket (**Photo 5**), then repeat with the other bracket. Now is a good time to step back and admire your work, because you're almost done. But if for some reason you messed this part up, just drill new holes and fill the old ones with putty. You can shift the position of the brackets if you want.

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2 CUT THE CURVED BRACKETS

For a curve like this, a smooth continuous cut is more important than following the line exactly. Any bumps or blips will be hard to sand out.



3 SAND THE CURVES WITH A SANDING DRUM

The trick is to go against the direction of rotation of the drill, with the drill going fast. If you make a gouge, angle the drum slightly to remove it.



4 NAIL ON THE EDGING

The edging is a stock molding from home centers. It keeps stuff from falling off the shelf and covers the rough ends of the shelf.



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Paint your shelf

Begin this part of the project by unscrewing the brackets. It's always easier to paint a project well if you can do the parts separately. Sand the pieces thoroughly to about 150 to 180 grit, removing sharp edges and corners, but not rounding them over too much. Wipe the sanding dust off with a rag and vacuum the parts thoroughly. Now set up your painting area. I highly recommend using spray paint for this project because it'll get you the smoothest finish.

Cover your work surface with paper or plastic, and set your shelf on strips or blocks to get it up off the surface. The shelf is pretty easy to paint, but go light on the edges to avoid drips. After the first coat of paint is thoroughly dry, sand it lightly with fine sandpaper, just enough to take off any roughness. Wipe and vacuum, then apply two final coats.

There's a trick to painting the brackets: Drive a long screw in one of the holes and use it as a little handle. That way you can spray the whole piece evenly in one shot (**Photo 6**). Then carefully set it down on a couple strips of wood to dry. When the paint is dry on all the parts, reassemble your shelf.

Hang your shelf

We recommend using small angle brackets to hang your shelf (**Photo 7**). Normally the top of a shelf is above eye level and the brackets are hidden, especially with items on the shelf. If your brackets are more exposed, give them a little spray paint to match the shelf, and paint the part that goes on your wall to match your wall. They'll be barely noticeable. Generally, though, this step isn't necessary.

To hang the shelf, use drywall anchors. Don't worry about hitting studs; there shouldn't be enough weight on this shelf to require it. Just put the shelf where you want it to go, make sure it's level, mark through the brackets where the anchors will go, and install the anchors. If it seems like you need a third hand to manage everything, you could draw a level line on the wall where the shelf will go. With the anchors in place, use the screws that came with the anchors to attach the shelf. Your shelf is complete! When you're ready to build more, check out the variations on p. 31.



5 SCREW THE BRACKETS TO THE SHELF

Notice that we've traced the shape of the bracket on the top of the shelf to help position the screw holes. We used a combination countersink/drill bit for the holes.



6 SPRAY-PAINT THE SHELF PARTS

You'll get better results by unscrewing the brackets and painting everything separately. A screw in the top of the bracket is a handy handle.



7 HANG YOUR SHELF WITH SMALL ANGLE BRACKETS

For a light-duty shelf like this, you don't need to screw it to the studs. Just make sure the shelf is level and use drywall anchors in the wall.

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CUSTOMIZE YOUR SHELF

Go ahead—play with this project! It's easy to make your shelf as long as you want it to be. Just put more brackets underneath it, maybe one every 2 ft. or so. You could also scale it up by using 1x8 lumber, or even wider stock, as long as you also scale up the brackets. Some of my other favorite variations are shown below. However, I have one strong recommendation: If you're doing anything more than changing the size or color, first make a prototype out of inexpensive pine. Your plates, pot lids, cooking tools or whatever will be different from ours, so make sure they fit.



POTHOOKS AND LIDS

This shelf has hooks screwed underneath to hold frying pans. We gave the hooks a dark finish by heating them with a torch as shown below. On our shelf, we cut off some of the threaded part of each hook with a bolt cutter because they were too long. The pot lids are held in place with two rows of 5/16-in. dowels. For heavier lids, use 3/8-in. dowels.



Blacken screw hooks with oil

Working outside, burn off the plating with a torch. Dip the hook into cooking oil and heat it until the oil burns off. You may need to repeat a couple times. This makes a hard, baked-on coating that resists wear. It's like seasoning a cast iron pan.



PLATES AND SPOONS

This shelf has a strip of molding (any kind will work) nailed on the top a couple inches from the back edge. This will keep plates from sliding off. The rod is 5/16-in.-diameter steel available at hardware stores. Cut it with a hacksaw and file the ends smooth. The trick is to drill the brackets before assembly, both at the same time, so the rod is perfectly aligned. The hooks are simple S-hooks, also a hardware item, opened up with a pair of pliers.



A wood strip makes it a plate rack

Tack a piece of molding to the top of the shelf to keep plates from sliding. Experiment with your plates to find the best location for the molding.



A FINE FINISH FOR OUTDOOR WOOD

Tips for using spar finishes

by Tom Caspar

editors@thefamilyhandyman.com

A spar finish is almost exactly like the interior polyurethane finishes we're all familiar with. It forms a shiny coating that protects the wood while accentuating the color and grain. The application is the same as with interior polyurethane too. The big difference between spar and interior poly is that spar stands up to exterior conditions. It's more elastic, so it's less likely to crack as wood shrinks and swells from moisture changes. It also protects wood from UV sunlight damage. Originally developed for boats, spar finishes are now used mostly for outdoor furniture and entry doors.

You'll find spar finishes at home centers in gloss, semigloss and satin. A quart costs less than \$20. Most formulas are oil based and labeled "spar urethane." Minwax Helmsman Spar Urethane is one common brand.

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SEAL THE LEGS

The end grain at the bottom of legs wicks up water like a thirsty sponge, providing a perfect home for the fungi that cause wood to rot. Sealing the end grain with spar (or any other finish) often fails because the end grain is so porous. Exterior wood glue fills the pores and seals out water much better. Brush on one coat, let it soak in and dry, then put on a second coat for good measure. If you slop any glue onto the visible sides of the legs, wipe it off and resand the spot before finishing.



KEEP LEGS HIGH AND DRY

Even when wood legs are sealed (see tip above left), they shouldn't stand directly on wet or damp surfaces. Plastic glides provide the perfect moisture buffer. A pack of four costs about \$2 at home centers.



LOAD AND WIPE OFF

To maximize the amount of finish your brush can carry, dip it in the can about a third of the way. Lift out the brush a few inches, then jab it toward the can to release excess finish. Dab the end of the brush on a white cotton rag to remove any finish that may have puddled there. Hang on to the rag as you work in case you need to wipe off excess finish inside a corner or around an edge.



WORK FROM THE BOTTOM UP

When you start brushing the first coat of a spar finish, begin at the bottom of your project and work your way up. If you get any runs or drips as you go, they'll fall on a finished surface and you can deal with them when you're ready. If runs or drips fall on an unfinished surface, wipe them up right away so their edges don't leave a shadow line.

TIP: Run screws into the ends of the legs to serve as standoffs. This way, you can start brushing at the very bottom of each leg.



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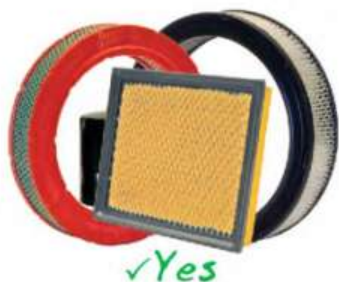
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CHECK FOR DRIPS

After you're done brushing a section, aim a light at it to check for drips. Hold the light at a low angle so the surface looks glossy. Even tiny runs, drips and skips will be easy to see.

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DAB AT DRIPS

If you spot a drip, stab at it with a dry brush, a technique called “stippling.” (To temporarily dry your brush, just wipe the tips of the bristles on a paper bag.) Brushing out a drip that has started to dry makes a gooey mess. Stippling is less likely to leave permanent blemishes. And if it does, the imperfections will be smaller and easier to sand flat after the finish dries.



SPRAY THE FINAL COAT

Spar in a spray can is convenient and provides a smooth, flawless finish. But it costs about \$9 per can, and a midsize project might require five or 10 cans. So here's an economical approach: Brush on two or three coats, then after final sanding, spray on a final, perfect coat.

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- 1 Make sure it's wireless.** A big vulnerability of traditional security systems is a burglar can snip one wire and shut down the whole system. A wireless system protects your home even if a burglar cuts your phone line or power.
- 2 Check that it has U.L. Certified** professional security monitoring. These are the professionals who send police if there's an emergency at your house. U.L. Certified means the monitoring centers are rigorously inspected every 6 months to ensure you get the highest caliber protection.
- 3 Compare monthly fees.** Many home security companies are notorious for gouging you with outrageous fees of over \$50 per month. With a little research, it's possible to find the exact same U.L. Certified protection for a fraction of the cost.
- 4 Watch out for sneaky “Gotchas.”** They're usually buried deep in the fine print of a home security contract. Here's an example from a real home security company's contract:

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by Jeff Gorton
editors@thefamilyhandyman.com

Cover a wall with stone veneer and transform a room!

You can transform any room with a stunning stone accent wall like this. Modern materials and methods allow you to create the look of a traditional stone wall with a fraction of the work. An intermediate DIYer could easily master the techniques. In this story, we'll show you how to install stone veneer on any interior wall of your house. In just a weekend, you can have a dramatic new accent wall.

STONE ACCENT WALL

HERE'S HOW IT WORKS

To provide a strong base for the stone, you attach cement board to the wall framing with screws. Then you use thin-set adhesive to bond the stone panels securely to the cement board for a worry-free installation. You can leave the existing drywall or tear it out first. Ledgerstone panels like the ones shown here don't require mortar—just stack them on the wall and you're done.





WHAT IT TAKES

COST: \$10 to \$20 per sq. ft.

TIME: Two days for an 8 x 10-ft. wall

SKILL LEVEL: Intermediate to advanced

TOOLS: Standard hand tools, tile saw, cement-board scoring tool, 1/4-in. glass bit for a drill or a rotary tool with a diamond wheel, 1/4 x 3/8-in. notched trowel, 1/2-in. corded drill and mixing paddle for the thin-set adhesive, level, chalk line.

1 SCORE THE CEMENT BOARD

Mark the cement board and line up your drywall square with the mark. Drag the tip of the scoring tool along the edge of the square to score the cement board. Repeat two or three times until you cut through the fiberglass mesh reinforcing.



2 BREAK THE BOARD

Bend the cement board to snap it along the scored line. Then cut through the mesh on the back of the board with a utility knife. Use the utility knife to clean up the cut and create a straight edge.



3 SCREW CEMENT BOARD TO THE STUDS

Drive screws through the cement board and drywall into the studs. Place screws every 8 in. along the studs.

Buying stone veneer

Search online for “stone veneer” and you’ll quickly discover the wide array of options available. You’ll find real and manufactured stone ranging in price from about \$6 per sq. ft. to more than \$20 per sq. ft. Some types are mounted on sheets that can be secured to a wall by simply stacking them and screwing through an attached flange. Other manufacturers specify that their stone only be applied to a wall that is covered with building paper, expanded metal lath and a coat or two of mortar. To see how this type of installation is done, go to familyhandyman.com and enter “stone veneer” in the search box.

Most thin stone veneer, whether it’s real or manufactured, can be installed on an interior wall using the method we show you in this article. We’re using stone that’s intended to resemble dry stacked stone, without any mortar joints. Each piece is 6 in. tall and 23-1/2 in. long and consists of several layers of thinner stones stacked and glued to one another. We bought this stone, called Golden Honey Ledger, at The Home Depot for \$6 per sq. ft.

Additional supplies you’ll need

Besides the veneer stone, you’ll need 1/2-in.-thick cement board, 2-1/4-in. cement-board screws, polymer-modified thin-set adhesive, mesh cement board tape and tile shims. You’ll find all these products at home centers and tile stores. Cement board is readily available in 32 x 60-in. sheets. Buy enough cement board to cover the wall, keeping in mind you may have to cut the center sheets down to 48 in. long so the ends land on studs. You’ll need about one 50-lb. bag of thin-set for every 70 sq. ft. of wall area, and one package of screws for every 40 sq. ft. of wall. You’ll use the tile shims to level the first row of stone.

You may also need electrical box extensions, wire connectors and short lengths of wire to remount outlets and switches. You'll find these in the electrical department at hardware stores and home centers.

Options for cutting the stone

We used a wet-cutting tile saw to cut the stone because this is the fastest and least dusty method. You can buy a tile saw like the one shown here for about \$300, or you can rent one for about \$50 per day. If you can cut outdoors and don't want to rent or buy a tile saw, you could use a circular saw with a diamond blade, or a grinder with a diamond blade, to cut the stone. But be prepared for a dusty, noisy job.

Getting started: Room preparation

Installing the stone will go a lot smoother and easier if you take some time to prepare the space. Start by moving everything out of the room. Parts of this job can be dusty, and you don't want to have to clean everything later. What you can't move out, cover with sheets of painter's plastic. Cover carpeted flooring with drop cloths. Protect hardwood and tile floors with a layer of cardboard or thin hardboard before covering them with drop cloths.

Pry off the baseboard trim on the wall where the stone will go, and on adjacent walls. If you'll be reinstalling the same trim, pull the nails from the back of the trim with an end cutter or a locking pliers. If you have chair rail or crown molding, you'll have to remove these, too.

To save a little time and effort, we're showing how to install the new cement board on top of the existing drywall. But if you want to add outlets or scone lights or do other extensive wiring, it may be easier to remove all the drywall from your wall.

If you decide to leave the drywall in place, mark the center of each stud with a chalk line so you'll know where to drive the cement-board screws. First use a stud finder or some other method to locate the center of each stud at the top and bottom of the wall. Then stretch a chalk line between the marks and snap the lines.



4 BREAK OUT OUTLET OPENINGS

Mark the outlet location on the cement board. Score all four sides and then score an "X" through the center. Tap with a hammer to create the outlet hole. Then clean up the edges with your utility knife.



5 DETERMINE THE LAYOUT WITH A STICK

To determine the height of the top and bottom rows of stone, cut a scrap of lumber to the height of the ceiling. Arrange stone on the floor and move the stick up and down to determine the top and bottom cuts. The goal is to avoid a narrow sliver of stone.



6 SNAP A LEVEL CHALK LINE

Mark the height of the first row of stone on each end of the wall and snap a level chalk line between the marks to indicate the top of the first row.



7 CUT ENDS WITH A TILE SAW

Mark the stone and set it on the sliding table of your tile saw. Line up the mark with the blade. Turn on the saw and simply slide the table toward the blade to cut through the stone.



8 CUT THE FIRST ROW OF STONE

Mark the stone pieces to fit between the chalk line and the floor. Align the mark with the tile saw blade and cut along the line. If your saw won't cut the full length, flip the stone around and finish the cut from the opposite end.



9 SPREAD THIN-SET FOR THE FIRST ROW

Mix thin-set and spread it below the line with a notched trowel. Press a test piece of stone into the fresh thin-set. Pull it off and check the back to make sure it's fully covered with thin-set. If not, use a trowel with larger notches or butter the back of the stone.

Dealing with electrical outlets and switches

Since you'll be adding cement board and stone to the wall, existing switches and outlets will have to be moved out to the surface of the stone. There are a few options for doing this. We added electrical box extensions (see **Photo 2**, p. 47).

Be sure to turn off the power to the switch or outlet before doing any work on them. When you add a box extension, it's possible that the old wires connecting the switch or outlet will be too short. If your wires don't extend 3 in. past the face of the box extension, add pigtails. For more information on how to do this, go to familyhandyman.com and search for "dealing with wires."

Install the cement board

Cut the cement board, making sure the ends of the sheets are centered on a stud. **Photos 1 and 2** show how. Use your utility knife to clean up the cut end by carving off any protruding chunks of cement. Attach the sheets with 2-1/4-in. screws spaced every 8 in. (**Photo 3**). Be sure to stagger the seams.

Photo 4 shows how to cut an outlet hole. Remember, you'll be covering the cement board with stone, so this hole doesn't have to be very accurate.

The final step in the cement-board installation is to reinforce the seams with self-adhesive mesh tape covered by a layer of thin-set. Apply the tape to the seams. Then mix a small batch of thin-set to about the consistency of peanut butter and trowel it over the tape.

Plan the layout to avoid surprises

You'll have to cut the stone to fit against both walls, the ceiling and the floor. But with careful planning, you can avoid having to finish with tiny slivers of stone.

To figure out the side-to-side layout, start by measuring between the walls. Then lay a row of stone on the floor, a little longer than the distance between the walls. Use your tape measure to see what the last cut would be if you started with a full stone on one end. If the last stone will need to be cut less than an inch long, plan to cut several inches off the first stone to allow for a wider finishing piece.

Next you'll need to figure out the horizontal cuts where the stone meets the floor and ceiling. It's tempting to measure down

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from the ceiling and start your stone so that you'll end up with a full piece against the ceiling. But doing this is likely to cause you problems. So instead, plan on cutting both the top and the bottom rows to fit against the floor and ceiling.

To figure the width of the cuts, first measure the distance from the floor to the ceiling. Then cut a 1x2 or other spare piece of lumber to this length. You'll use this measuring stick (called a "story pole") to determine the best stone layout. Arrange stone on the floor to create a stack a little longer than the length of the story pole. Set the story pole on the stack of stones and move it up or down until you find a position where both the top and the bottom stones will need to be cut to fit, without leaving a sliver. When you've found a good spot, mark the stone at the bottom of the stick (**Photo 5**). Measure from this mark to the top edge of the bottom stone. In our case, this distance was 5-1/2 in. You'll use this measurement to position the starting chalk line.

To ensure that the first course is straight and level, snap a level chalk line on the wall to indicate the top of the first row of stone. Using a 4-ft. level or a shorter level held on top of a straight board, check to see whether the floor is level across the width of the wall. If the floor is level, use the measurement you determined using the measuring stick to mark the distance from the floor to the line at each end of the wall, and snap a line (**Photo 6**). If the floor isn't level, measure up from the low side and level across the room to make a mark at the other end. Then snap a line between the marks.

Install the stone

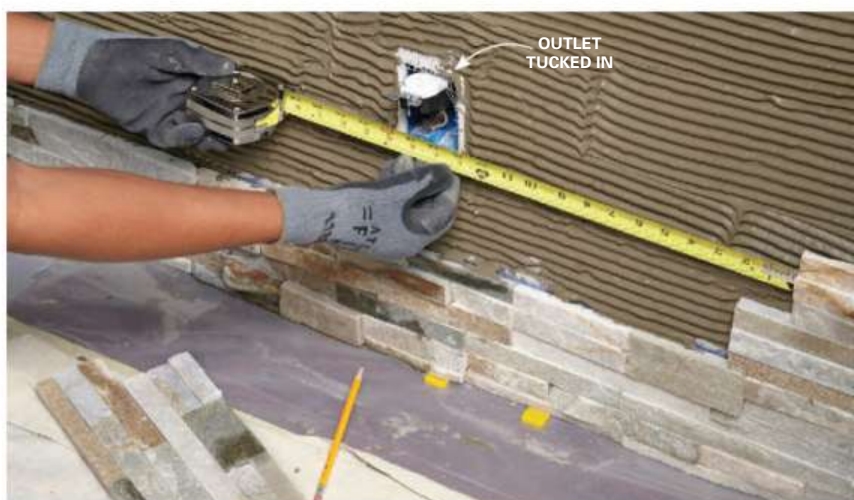
With the prep work done and the level line marked on the wall, you can get started with the fun part, installing the stone. The first course takes a little longer because you have to cut it to fit to the line, but after that, the stone will go up quickly. Cut and dry-fit the first row of stone before you mix and spread any thin-set. Measure from the floor to the line and subtract 1/8 in. to determine the height of the stone pieces.

Photos 7 and 8 show how to cut the ends of stone pieces and how to make the long rip cuts. If you're having trouble seeing the cutting line because it's being washed off by the wet-saw spray, apply masking tape to the stone before you mark it, and then draw the line on the tape.



10 ALIGN THE FIRST ROW WITH THE CHALK LINE

Press the stone pieces into the thin-set. Then slide shims underneath until the top edge is perfectly aligned with the chalk line. This will ensure that the following courses of stone will be straight and level.



11 MEASURE FOR THE OUTLET NOTCH

Measure from the closest installed stone and transfer these marks to the stone you need to notch. You can stick masking tape to the stone for easier marking.



12 NOTCH AROUND OUTLETS

Cut out the notch with the tile saw by making a series of closely spaced cuts that end at the line for the bottom of the notch. Tilt the stone up to create a square-bottom cut. Then break out the fingers and clean up the cut with a back-and-forth motion through the saw.

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13 CONTINUE INSTALLING STONE

Work your way up the wall, offsetting the starting pieces so the joints will be staggered and less visible.



14 ATTACH SHELVES WITH ANGLED SCREWS

Apply construction adhesive to the back edge of the shelf and rest it on top of a stone. Press the shelf against the wall while driving angled finish-head screws through the shelf and into studs. Make sure to position the shelves over two studs.



15 CUT STONE TO FIT OVER THE SHELF

If your shelves are exactly as long as one piece of stone, you can simply cut off the thickness of the shelf from the length of one piece of stone. Otherwise, notch the stone to fit around the shelf.

When the first row of stone is ready to install, mix a bag of thin-set mortar according to the instructions on the package, using a 1/2-in. drill and a mixing paddle. Spread thin-set below the line (**Photo 9**) using a 1/4 x 3/8-in. notched trowel. Press the first piece of stone into the thin-set. Then remove it and check the back to make sure it's completely covered with thin-set. If not, you'll have to use a 1/2 x 1/2-in. notched trowel instead, or "butter" the back of each piece of stone by spreading a layer of thin-set over it with the flat edge of your trowel, and then setting it into the thin-set on the wall. Slide plastic tile shims under the stone pieces to align the top edges with the chalk line (**Photo 10**).

The seams between the stones will be less visible if you stagger them. To do this, start the second row with a piece that's about two-thirds as long as the piece below it, once again checking to make sure you don't end up with a thin sliver at the far end. Spread enough thin-set to apply about two more rows of stone and work your way up the wall. Continue like this until you reach the top.

Cut the stone to fit around electrical boxes

It's almost certain you'll have to cut around at least one outlet. We show how to notch the stone piece to fit (**Photos 11 and 12**), but if your outlet falls in the center of a piece, you'll have to use a slightly different technique. Mark the outlet on both sides of the stone. Then you can either use the tile saw, or an angle grinder with a diamond blade, to plunge-cut on all four sides. Start on the front of the stone and plunge until the cuts just reach the corners. Then flip the stone over and plunge-cut until the center piece falls out. You may have to clean out the corners with a dull wood chisel, a glass-drilling bit in a drill, or a rotary tool. Later we'll show you how to mount the outlet and fit the cover plate to the irregular stone surface.

Mount the optional shelves

We decided to add small floating shelves to the stone wall. We built ours by gluing two layers of 1x8 poplar together, cutting them to the length of one stone piece—in our case, 23-1/2 in.—and ripping them to 6-1/2 in. wide on a table saw. Then we applied ebony stain and finished them with two coats of satin polyurethane.

Plan the shelf positions by arranging

strips of masking tape on the wall, making sure that there are two studs behind every shelf. Then when you reach the level of a shelf with the stone, apply construction adhesive to the back edge of the shelf, rest the shelf on the stone, and drive 3-1/8-in. finish-head screws at an angle into the studs (**Photo 14**) to hold the shelf in place. Rip 1-1/2 in. from the bottom of a stone piece to fit over the shelf (**Photo 15**). You can work from the shelf toward the walls on both sides to finish the row of stone.



Finish up with the top row of stone

Don't spread any thin-set in the area behind the top row of stone. Instead, apply the thin-set to the back of each piece before setting it in place. This allows you to dry-fit the piece and makes it easier to avoid accidentally getting thin-set on the ceiling. Measure between the top stone and the ceiling, and transfer these

16 CUT AND FIT THE TOP ROW

Complete the project by installing the top row of stone. Measure and cut each piece and test the fit. Then spread thin-set onto the back of the stone pieces and press them in place.

measurements to the stone pieces for cutting. Use the technique we showed you in **Photo 8** to cut the top row of stones. After you've checked the fit, spread thin-set on the back of the stone and press it onto the cement board (**Photo 16**).

Reinstall the moldings

All that's left to do is to reinstall the baseboards. You'll have to scribe the ends of the baseboards to fit against the irregular stone surface. To see how to do that, search for "scribing" at familyhandyman.com.

FITTING OUTLETS AND SWITCHES

Since the surface of the stone is too irregular for mounting the outlet and cover plate, the first step is to carve away the stone to create a flat mounting surface. This isn't as difficult as it sounds, because the area you need to flatten extends only about 3/8 in. beyond the hole in the stone.

First, make sure the power is still turned off. Then, start by temporarily connecting the outlet to the box using the long screws included with the box extension. Set the cover plate over the outlet, making sure it's level, and trace around it. Now remove the screws that hold the outlet to

the box and move the outlet of the way. We used a rotary tool with a diamond wheel attachment to cut the stone, and an old wood chisel to square up the corners. You could also use a 1/8-in. glass-cutting drill bit mounted in a drill to chisel away the stone.

Start by cutting the outline of the cover plate. Then cut away protruding stone inside the line until you have a flat surface for the cover plate (**Photo 1**). Then simply reattach the device, along with the new box extension (**Photo 2**). Finish up by installing the cover plate (**Photo 3**).



1 CARVE A FLAT SPOT FOR THE COVER PLATE

Hold the cover plate in position over the outlet and trace around it. Now use a diamond wheel in a rotary tool or a 1/8-in. glass-drilling bit in a drill to carefully smooth out the stone in the area under the cover plate.



2 INSTALL THE BOX EXTENSION

Slip a plastic box extension over the outlet and slide it into the electrical box. Mount the outlet to the electrical box with the extra-long screws provided in the package.



3 ATTACH THE COVER PLATE

Set the cover plate into place and make sure it's tight to the stone, without large gaps. If it's a good fit, screw it onto the outlet.

What every homeowner **MUST** know

BY GARY WENTZ

editors@thefamilyhandyman.com



PREVIEW A FENCE

Will a privacy fence really deliver privacy—or hide your neighbor's junk collection? Finding out is easy with a big sheet of cardboard. Along with a helper, you can determine the best location and height.

BUY BETTER DUST MASKS

Dust isn't just a sneeze-inducing nuisance—heavy repeated exposure can lead to severe allergic reactions and even harm your lungs. You can buy a dust mask for as little as 50¢, but don't. Instead, spend a few bucks on one with an "N95" certification. You'll get a mask that's more comfortable and truly effective at keeping dust out of your lungs.



Before you buy a toilet ...

Here's a story we've heard a hundred times: Homeowners go toilet shopping and decide that an "elongated bowl" would be an improvement over the old "round" bowl. Only later—usually after installation—they discover that the bathroom door can't be closed, and laughing, crying or swearing follows. So if you want a longer bowl, measure first. A typical elongated toilet protrudes 2 in. more than a standard model. Also check the clearance for any nearby cabinet doors.

Keep cash for blackouts

In a blackout, cash is king. Some stores may stay open, but they probably won't be able to process credit card purchases. And all the cash machines will be on strike. So keep an emergency cash stash on hand.



ART DIRECTION MARY SCHWENDER • PHOTOGRAPHY HSP

DON'T FALL OFF THE ROOF

Personal fall arrest systems used to be for pros only. But prices have fallen—and you can afford them too. A complete kit costs about \$100 (search online for “roof harness”). Whether you have a major roofing job planned or just need to clean the gutters, it's a smart, safe move.



Our favorite floor protector

Canvas or plastic drop cloths are slippery on hard flooring like wood or tile. For protection that stays put, you can't beat rosin paper. Just tape sheets together and tape the perimeter to the floor. Be sure to vacuum before you lay the paper; grit trapped under the paper can lead to floor scratches. A single layer will protect against paint drips, but wipe up larger spills before they can soak through. For remodeling projects, tape down two or more layers. A big roll of rosin paper costs less than \$15 at home centers.

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COVE LIGHTING

Soft light and rich drama for any room

Bored with your living space? Cove lighting can add an understated elegance and breathe life into the most uninspiring room. We'll show you how we built ours using LED strip lighting and demonstrate how to wire it up. We'll also give you the lowdown on this type of lighting and share other cove and lighting options that might be a perfect fit for your budget and décor.

by Mark Petersen
editors@thefamilyhandyman.com

Is cove lighting right for you?

You may think your ceiling looks good now, but when the cove lighting rakes across the surface, you may discover seams and nail pops you never knew existed. Stand on a ladder and shine a flashlight across the surface of the ceiling. If your ceiling is super ugly, you may want to abandon the idea or build a cove that washes the walls with light instead.

Our cove lighting design

Our cove is built from crown molding and set 2 in. down from the ceiling. We installed the crown on top of a baseboard to create a wider space for the light, and tacked a small cove molding onto the bottom of the base to finish it (Figure A). We fastened the light strip to the wall so the lights would rake across the ceiling, and in order to maximize the light, we kept the strip as high as we could without its being visible from the ground.

Make a small mock-up and experiment with different positions for the cove and lights. Every room is different, and the cove we made may not be the best style for your room. Check out “Design Your Own” on p. 56.

Paint first

It's easier to paint all the cove parts before you install them. Touching up a few nail holes after installation is a lot easier than taping off entire walls. Painting the part of the wall that will be seen above the cove will help tie everything together. Choose either the color of the ceiling or the color of the cove. Lighter colors reflect more light, so paint the back of the cove components as well.

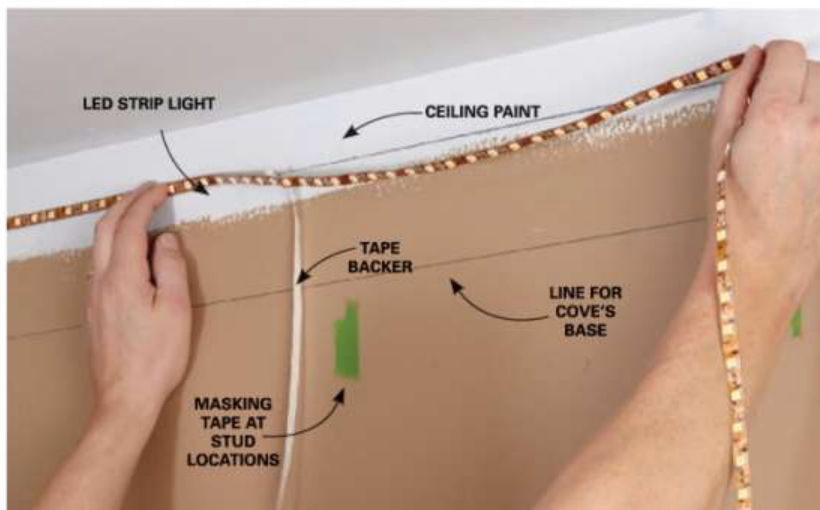
WHAT IT TAKES

TIME: One weekend

COST: \$3 per lin. ft. for cove; \$12 per lin. ft. for lights (see p. 55 for less expensive options)

SKILL: Intermediate

TOOLS: Table saw, miter saw, 18-gauge brad nailer, compressor, drill



1 STICK ON THE STRIP LIGHTS FIRST

If you plan to attach the lights to the wall, it's easier to install the lights before you build the cove.



2 FASTEN THE BASE

Drive 2-in. screws through the base into each stud. Sink the screws flush and place them high enough to be covered by the crown molding.



3 ATTACH THE SUPPORT BLOCKS

Cut blocks to support the crown molding. Fasten them into place with 2-in. 18-gauge brads. Mark them so you don't confuse which way is up.

Mark the wall

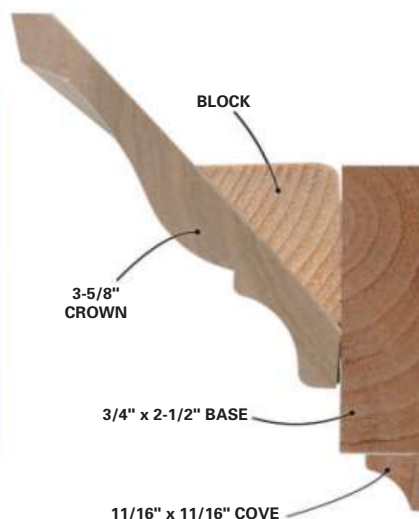
Draw reference lines to indicate the bottom of the light strip and the bottom of the base. Don't worry whether the lines are level. Instead, measure down from the ceiling in several places and connect the dots to achieve a consistent distance between the cove and the ceiling. Years of settling can throw a ceiling out of level. A cove not in line with the ceiling will create a noticeably uneven gap. Save time by cutting a couple blocks of wood to use as marking gauges.

Install the light strip

When you're placing the LED strip on the wall rather than inside the cove, it's easier to install most of it before the cove is up. Begin at the point of the room where the transformer will be installed. Leave the tape backer on the first few feet of the LED strip so it can be pulled away from the wall when it comes time to connect it to the transformer.

The tape on the back of the strip is super sticky. Once it's on the wall, it's tough to remove without pulling off the paint along with it. To start, press the strip to the wall in one spot, hold it there, pull the tape out a couple feet, and press it to the wall at that point as well (**Photo 1**). Do this a few times in a row, and check to see if it's straight. If it is, go back and press the rest of the tape tight to the wall. Strip lights like these can be cut to

Figure A
Cove design



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4 CUT OUT THE EXISTING OUTLET BOX

Pull the power for the lights from an existing box on an interior wall. Cut out the nails and remove the existing box. Replace it with a larger box to make room for the new wires. Removing the existing box will also simplify fishing in the new cables.

size but only in certain intervals, usually 2 to 4 in. There will be clearly marked cutting lines on the strip.

Build the cove

Secure the base to the wall with 2-in. screws into every stud (**Photo 2**). Self-tapping trim-head screws work great. Keep the screws high enough so they get covered by the crown. Depending on the size of the transformer, you may need to notch out a section of the base to make room so it's not visible from the floor (**Figure B**, p. 59).

Cut blocks to support the crown. One easy way to figure out the angle for the blocks is to hold a section of crown next to your table saw blade and adjust the blade to the same angle as the crown. Rip a 2x4 at that angle. Before installing the blocks, indicate with a marker which way is up. Stagger the blocks about every 16 in. or so, and fasten them with 2-in. 18-gauge brads (**Photo 3**).

Working with cove molding can be tricky, and in this article, we don't cover all the techniques for measuring, cutting and coping. For more information, search for "crown" at familyhandyman.com or go to the DIY University, mydiyuniversity.com, and take a course on crown molding.

Finish up by installing the small cove at the bottom. Fasten the cove with 1-1/4-in. brads angled up into the base (**Figure A**).

Fish the new cables

Pick an existing outlet on an interior wall to pull power from so you don't have to deal with insulation when you fish the new cables. There's a good chance the existing electrical box may not be big enough for additional wires, so plan to replace it with a larger 20-cu.-in. remodel box (sometimes called an "old work" box). Removing the existing box also makes it easier to fish in the new cables. Shut off the power, then poke a hacksaw blade on either side of the existing box to find which side the stud is on, and cut out the nails that hold it in place (**Photo 4**). If this kind of electrical work is intimidating, you could learn all you need to know by taking a few electrical courses in *The Family Handyman's* DIY University (mydiyuniversity.com).

Use the remodel box as a template to cut a hole in the wall for the new light switch. There's no need to cut the hole next to the stud. Remodel boxes are held in place with wings that clamp onto the back of the

OTHER LIGHTING OPTIONS

LED lighting isn't cheap. A system like we installed costs \$9 to \$14 per ft. for 22 ft., but less expensive options are available:



Plug-in LED strip lighting

Home centers sell strip lighting with a prewired transformer. These would work well for shorter runs but need to be plugged into a receptacle hidden behind the cove. They can be wired to a regular switch, but the dimmer is located on the transformer, which won't be easily accessible. \$8 per ft. for 8 ft.



LED rope lighting

The cheapest option by far is to install an LED rope light. Rope lights are not low-voltage, and they can be run long distances and dimmed with a regular dimmer. On the downside, they cannot be cut to size or split off in more than one direction; it's harder to direct the light; and the light is about one-third as bright and tends to be a little blotchy depending on where it's placed. Rope lighting would also require a receptacle behind the cove. \$2.75 per ft. for 13 ft.



With the Carey Brothers
Tips of the Month



TOILET FLANGE TILE GUIDE

If you've ever remodeled a bathroom that included changing out a toilet and installing tile flooring, you know what a daunting task it can be to tediously nip the tile to take the shape of the circular toilet flange. This process can slow down a project and leave gaps between the tile flooring and flange that can lead to rot and costly repairs. We discovered a neat little product that addresses these challenges and offers other benefits. The Toilet Flange Tile Guide is a durable plastic template with square corners that fits snugly around the flange and leaves straight sides where tile can be easily cut straight. It makes for faster, easier and cleaner installation. Simply install it around the toilet flange and fasten it to the floor and toilet flange using construction adhesive. The Toilet Flange Tile Guide comes with a durable adhesive-backed temporary cover that will protect the flange and prevent debris from getting into the drain during construction. It also prevents sewer gas from entering the room – eliminating the need to stuff a rag into the sewer pipe. Install your flooring, peel off the temporary cover, place your wax ring, install your toilet and, presto, your job is complete! Toilet Flange Tile Guide can be found at retail for under \$8. barracadabricks.com



NO MORE DIRTY, MUSTY APPLIANCES

If you have a front load washer, chances are good that you have experienced "musty clothes syndrome." You wash and dry your clothing and they come out smelling, well, not fresh. A similar odor may be found at your disposer and/or dishwasher. What's more, the inside of your dishwasher or microwave can look like a full-blown science experiment. And that's just what you can see! Summit Brands, manufacturer of effective and sustainable consumer cleaning products, has come to the rescue with its Glisten® line of five "machine cleaning" products: *Disposer Care Drain & Foaming Cleaner*, *Disposer Care Drain & Disposer Freshener*, *Dishwasher Magic Machine Cleaner & Disinfectant*, *Washer Magic Machine Cleaner & Deodorizer*, and *Microwave Cleaner*. Unpleasant odors aside, dirty appliances produce poor results, are less water and energy efficient, and can lead to early failure. Most appliance manufacturers recommend monthly cleaning to optimize the performance of the machines. Used according to directions, Glisten is safe, effective and environmentally friendly.



You can even use Glisten if you have a septic system. Glisten products can be found at brick-and-mortar and online retailers everywhere. glistencleaners.com

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Want to build your electrical skills before you tackle this project? Check out the "Electrical Basics" course at mydiyuniversity.com.



5 FISH THE CABLE

Cut a hole in the wall for the switch box, and run a cable down through the outlet box hole below it.

drywall. Cut the hole for the switch box with a jab saw or utility knife at the same height as the other switches in the room. Fish the new cable from the switch box hole down and out through the existing hole below it (**Photo 5**). Put a slight bend on the cable so it hugs the back of the drywall, which makes it more easily accessible.

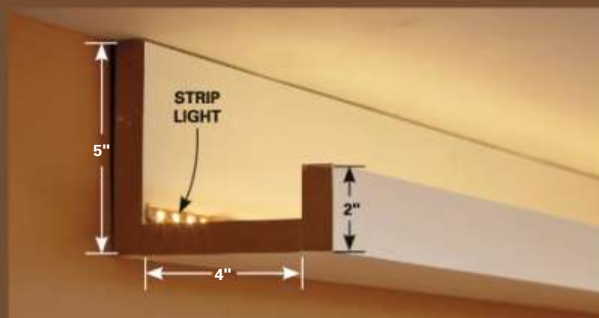
In this article, we used a transformer that is hardwired, so an outlet box wasn't necessary. We just had to drill a 3/4-in. hole in the drywall above the cove and run a cable down to the switch (**Figure B**, p. 59). There are other lighting options that may require an outlet above the cove. The procedure is the same as the next step; just be careful to place the new outlet so it's completely hidden behind the cove. It will also help to install a recessed outlet box for the light's power cords.

Whether or not you install an outlet, leave a few feet of cable sticking out of the wall at the top. That will make it easier to wire the transformer. The excess cable can be pushed back into the wall cavity after the connections have been made.

Be generous and remove 10 in. of the cable's sheathing and strip the end of each wire before pulling them into the box. Make sure there's at least 1/4 in. of sheathing extending into the box and 3 in. of wire length extending beyond the face of the box (**Photo 6**). Don't overtighten the box

DESIGN YOUR OWN

You don't have to build your cove exactly the way we did. Here are a couple alternative styles:



A SIMPLE COVE:

This easy-to-build, easy-to-install cove is made from 3/4-in. MDF ripped to size on a table saw. Countersink the screws. Fill the holes and touch up the seams with wood filler or surfacing compound.



VALANCE STYLE:

Shine light both on the ceiling and down the wall with this valance-style cove. This one is made from straight 3/4-in. clear pine. The sharp edges of the valance have been softened with a router fitted with a 1/8-in. round-over bit. Install the T-shape base to the wall first and then fasten the valance to the base. Plan to buy twice as much lighting.

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onto the drywall or you could strip the screws or damage the portion of the drywall that holds it in place.

Complete the connections

The existing receptacle will need to be replaced with one that is both tamper resistant (TR) and protected with an AFCI (arc fault circuit interrupter). AFCI interrupters protect homes from fire and are now required in most locations of the home. The AFCI has “line” and “load” terminals and cannot be connected with “pigtail” wires like the existing outlet may have been (**Figure B**).

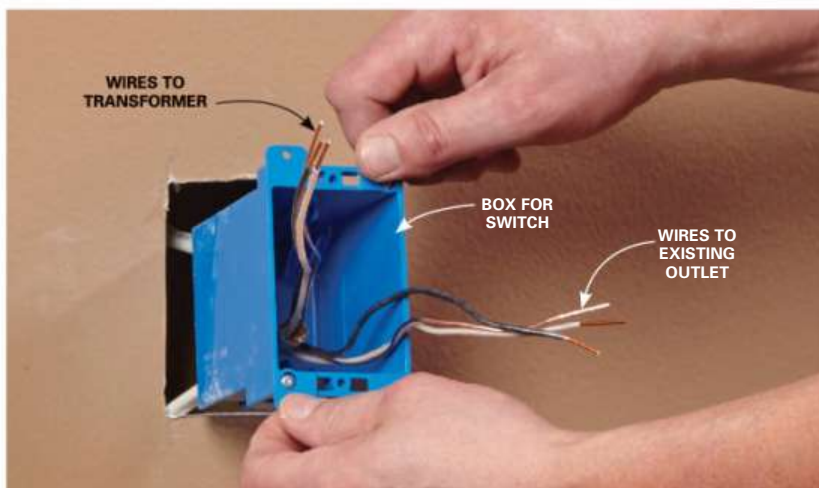
It's extremely important for the dimmer switch to be compatible with the LED light strip you install. You need a “low-voltage” compatible switch, not an “LED” compatible switch. The wrong switch will cause the lights to flicker or not work at all. We used a Lutron switch recommended by the lighting supplier.

Transformers come in many shapes and sizes. Follow the wiring directions on your particular transformer. Once the transformer is connected, slide the excess cable back into the wall cavity and finish securing the strip light (**Photo 7**). Stick the transformer to the wall with Velcro strips if it won't stay in place, and install cable straps with drywall anchors.

Install the crown

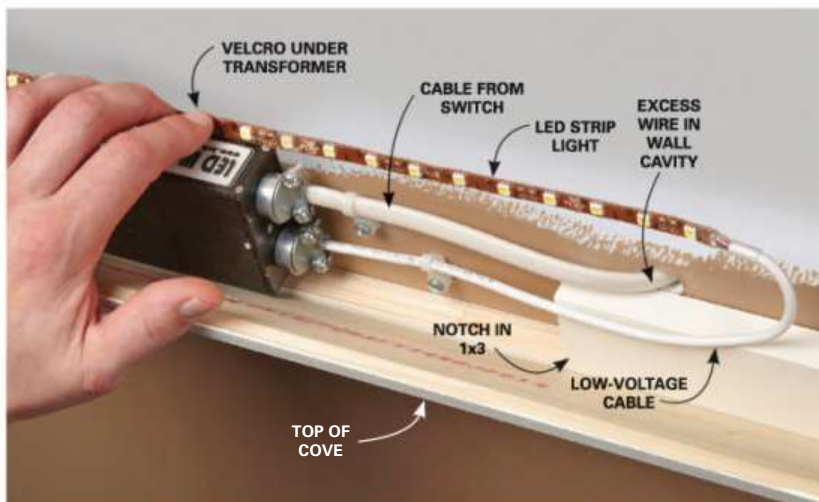
Fasten the bottom of the crown to the base every 16 in. with 1-1/4-in. 18-gauge brads. Secure the center of the crown to the blocks with 2-in. brads (**Photo 8**). To avoid nailing through the tops of the blocks, aim the gun straight in toward the wall rather than angling it up toward the ceiling. You don't want to poke yourself on an exposed brad or damage the light strip with a wayward shot.

All that's left is to flip the power back on and plan that dinner party so you can show off to all your friends.



6 INSTALL THE NEW BOXES

Pull back the sheathing, strip the end of the wires, and pull wires into the remodel boxes before inserting them in the holes and clamping to the drywall.



7 CONNECT THE TRANSFORMER

Leave extra cable up top so the transformer can be pulled away from the cove to be wired. The excess cable can be pushed down into the wall cavity. Notch out the base so the transformer can sit lower in the cove.

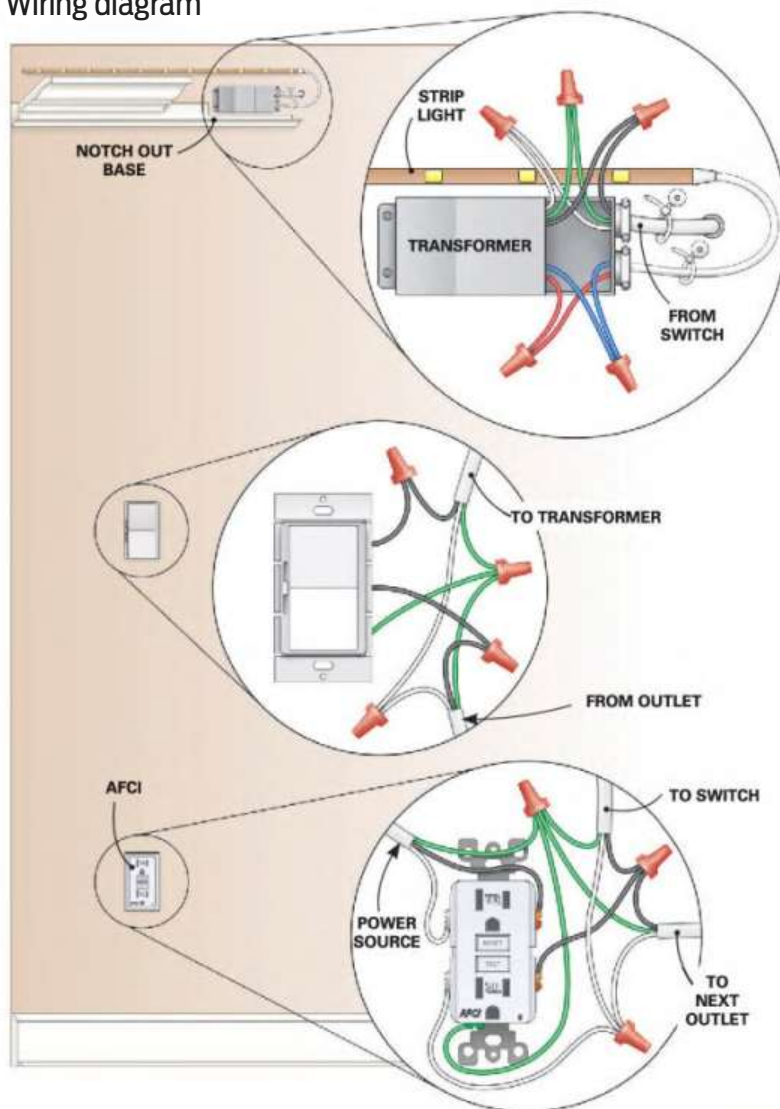


8 INSTALL THE CROWN

Tack the bottom of the crown to the base with 1-1/4-in. brads and to the blocks with 2-in. brads.



Figure B
Wiring diagram



CHOOSING LED LIGHTING

It's very important to think of low-voltage LED lighting as a "system." Transformers are available in 12-volt, 24-volt, magnetic, nonmagnetic, dimmable and nondimmable. The transformer, strip lighting and dimmer switch all need to be compatible.

You'll also have to consider how much lighting you need. Two transformers may be required for large rooms because each transformer can only provide power for a specified length of strip lighting. The lights at the end of a long run will be dimmer than the others if hooked up to an undersized transformer.

White light is most often used in

commercial settings or outdoors, while warmer colors are preferred for homes. Brighter (more lumens) strip lighting costs more but is a good option. Strip lighting that is run at less than full power will last longer. Some lighting systems can last up to 50,000 hours.

Your best bet is to stop in at a lighting store, or call an online retailer, and explain the dimensions and layout of your room exactly. We bought our lighting from LED WORLD at ledworldlighting.com. The staff were extremely helpful in presenting our options and making sure we had all the proper components to finish our project.

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Replacing shutoff valves

If you're servicing or replacing a toilet or sink faucet, the first step is to shut off the water supply valve that feeds the fixture. But the simple task of shutting off the valve can be the start of a whole set of unexpected headaches.

Unless your house is fairly new, chances are you have multi-turn shutoff valves at every toilet and faucet. Shutoff valves perform flawlessly for years. But when they aren't opened or closed for a long time, you may find that the valve handle either won't turn or will turn but won't stop the water flow completely. And even if the valve does shut off the water, it may leak when you reopen it—the last thing you need after a plumbing repair!

You can spend time rebuilding the old valve, but the problems will just reappear years from now. The best way to deal with bad valves is to replace them with modern quarter-turn ball valves. They rarely lock up, leak or wear out and cost only \$10. Best of all, they'll take just an hour or so to install. Here's how to put them in.

Identify the valve connection style

Shutoff valves connect to copper plumbing pipes in one of two ways: compression fitting or sweat fitting. Identify the connection type used in your home by referring to the photos on p. 61. If you have an older home with galvanized pipes, we suggest hiring a plumber to do the switch-out. Unscrewing the old valve and screwing on a new one may seem easy enough. But if the pipe is rusted internally or the threads are rotted, this "simple" plumbing job can turn into a plumbing nightmare. If your home is plumbed with PEX or plastic pipe, these instructions don't apply.

Once you identify the connection type, buy a quarter-turn shutoff ball



valve to match the size of the incoming copper pipe and the size of the supply tube connection. If you're replacing a sweat valve, you'll need a torch, flux, solder, emery cloth, wire brushes and a flame protection cloth to shield the wall. This is also a good time to replace an old supply tube and a corroded escutcheon (wall trim plate).

Prepare for valve replacement

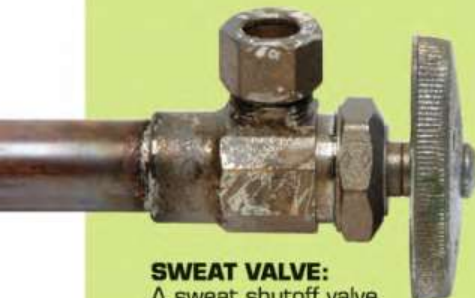
Shut off the water at the main shutoff valve. If you have a gas water heater, turn the knob to the "pilot" position. Shut off the circuit breakers

to an electric water heater. Then open a faucet on the lowest level of your house and another faucet on an upper level to drain the pipes. Then disconnect the supply tube from the shutoff valve. Replace the valve.

After replacement

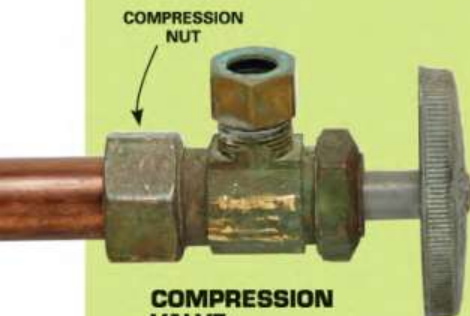
Close the new valve. Then open the water-main shutoff valve and let the water run until all the air is out of the pipes. Then shut off the upper and lower faucets. Check the new valves for leaks. Turn the water heater gas valve back to "on" or flip on the circuit breakers to the electric water heater.

VALVE TYPES



SWEAT VALVE:

A sweat shutoff valve doesn't have any hex flats where the copper tubing enters from the wall. Replace a sweat valve with another sweat valve or a compression valve.



COMPRESSION VALVE:

Examine the portion of the valve closest to the wall. Look for a hexagonal compression nut and matching hex flats on the body of the valve next to the compression nut. If the valve has a compression nut but no hex flats, look for two flats on the sides of the valve body.



THREADED VALVE: Look for threads and hex flats where the steel pipe enters the valve.

Replace a sweat valve

Hold the valve with a pliers, loosen the packing nut and unscrew the entire valve stem. Peek inside and remove the old washer if it's stuck on the seat. Removing the valve stem allows any remaining water to drain out, making the unsweating process easier. Before you do any torch work, make sure there's a fire extinguisher nearby and safeguard the wall with a flame protection cloth. Then remove the old valve (**Photo 1**) and the remaining solder (**Photo 2**).

Clean the tubing with emery cloth. If you're replacing a sweat valve with a compression valve, sand off all traces of solder before adding the new escutcheon, nut and sleeve. Otherwise,

remove enough old solder to allow the new sweat valve to slide onto the tubing. Remove the stem and wire-brush the opening in the new quarter-turn valve and apply flux to the valve and the copper tubing. With the flame protection cloth in place, heat the valve just enough to draw in the solder.



1 REMOVE THE OLD SWEAT VALVE

Drape the flame protection cloth over the copper tubing and tape it to the wall. Adjust the torch to a small flame and aim it toward the body of the valve. As soon as the solder melts, twist and pull the valve off the copper tubing with a pliers.



2 CLEAN EXCESS SOLDER

Put on a leather glove and grab a damp cotton rag (microfiber cloth will melt). Heat the remaining solder with the torch until it's molten. As soon as the solder melts, wipe away the excess solder with a damp rag. Be sure to wear leather gloves to prevent steam burns.

Remove and replace a compression shutoff valve

To remove a compression-style valve, hold the valve body with an adjustable or open-end wrench, or a slip-joint pliers. Grab the compression nut with another wrench and turn it clockwise to loosen it. Then pull the valve off the copper tubing.

Next, remove the old compression sleeve and nut. Grab the old sleeve with a pliers, using minimal pressure to avoid distorting the copper tubing. Then rotate and pull it off the tubing. If the sleeve is stuck, saw it (**Photo 1**) and break it (**Photo 2**).



1 SAW PARTIALLY THROUGH THE SLEEVE Use a hacksaw to cut partially through the sleeve at an angle. Use short strokes to avoid cutting into the copper tubing. Check your progress and stop cutting before you reach the copper.



3 POSITION THE NEW COMPRESSION SLEEVE Slide the new compression sleeve onto the copper tubing. If the old sleeve left depression marks, locate the new sleeve slightly forward of the marks.

Slide the new escutcheon and compression nut onto the copper tubing. Then add the new compression sleeve (**Photo 3**). Insert the new valve and apply a very light coating of pipe dope to the compression sleeve. Next, screw the compression nut onto the valve until snug. Hold the valve with a wrench or a pliers and tighten the nut a one-half to three-quarters turn (follow the manufacturer's tightening instructions). Connect the supply tube and test for leaks.



2 TWIST AND BREAK THE SLEEVE Insert a flat-blade screwdriver into the cut and twist the screwdriver to break the sleeve. Slide off the old sleeve, old compression nut and the escutcheon (if you're going to replace it).



CAN YOU USE A PUSH-FIT VALVE?

Several companies make quarter-turn push-fit ball-style shutoff valves that install without tools. They're a good alternative to sweat and compression fittings if you have enough tubing projecting out from the wall and if that tubing is in good shape. They make the job even simpler. If your stub-out tubing is perfectly symmetrical, long enough and has a square-cut end, you might be able to use a push-fit valve to replace your old compression or sweat valve.

Most push-fit valves require at least 1 in. of stub-out tubing. So measure the length of the stub-out and refer to the valve manufacturer's length requirements before buying. If your tubing will work, shop for a valve that meets your configuration needs (straight or angled). Push-fit valves are available with and without a permanently mounted supply



tube. We don't recommend the permanently installed supply tube version because you have to shut off the water and replace the entire unit if the supply tube ever needs replacement.

Before installing a push-fit valve, remove any burrs from the open end.

If you're replacing a sweat valve, remove all traces of solder and ensure the tubing is perfectly round. Then mark the installed length on the tubing and push the valve onto the tubing until it reaches the mark.

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Top Ten TIPS

BY GARY WENTZ

editors@thefamilyhandyman.com

Make exterior caulk last



ART DIRECTION VERN JOHNSON • PHOTOGRAPHY HSP • ILLUSTRATION FRANK ROHRBACH III

Exterior caulking is a lot like interior caulking: Your goal is a neat-looking seal over cracks and gaps. But outdoor caulking deserves some extra attention. It will have to withstand all the extremes that nature can dish out. And when an outdoor seal fails, water gets in and serious trouble follows. So here are some tips for caulking that lasts.

1 Choose acrylic for most jobs

Acrylic caulk is easy to use, easy to smooth out and easy to clean up. And since it offers reasonably good flexibility and adhesion, it's a good choice for most exterior gaps narrower than 1/4 in. Some acrylics are labeled "acrylic latex." With others, you have to read the fine print to find "acrylic." Price is a good guide to quality; bypass the cheap stuff and spend \$4 to \$5 per tube. Saving a few bucks on the seals that protect your home from water damage is a bad bargain.

2 Consider polyurethane

In terms of performance, polyurethane is just plain better than acrylic caulk. It sticks better and retains its flexibility longer. The downside is that polyurethane is more difficult to apply neatly, harder to smooth out and tough to clean up. You have to mask off porous surfaces and keep mineral spirits handy. For some situations—concrete, roofing, gaps wider than 1/4 in.—polyurethane is definitely worth the hassle. But consider it for some standard jobs too. With all the time and effort a repair or redo would take, polyurethane might save you trouble in the long run.



3 Start with a clean crack

Caulk won't stick well to dirty surfaces. On siding and trim, dig out any loose paint, caulk or other crud, then sweep them with a dry paintbrush or—better yet—blast them with a compressor and an air nozzle. You may not get cracks completely clean, but the cleaner the better. To clean out cracks in concrete or other masonry, all you need is your garden hose. Just be sure to allow plenty of drying time before you caulk.



4 Prime before you caulk

When it comes to wood (or wood-based materials like hardboard), primer sticks better than caulk and provides a great adhesion surface for caulk. So if caulking is part of a painting project, it's best to prime before you caulk. Work the primer into gaps, but don't try to fill them with primer.

5 Don't 'caulk' with paint

Paint will fill or bridge tiny gaps—but only temporarily. Paint simply doesn't have the flexibility of caulk. As gaps shrink and grow, the paint will eventually crack. That will allow moisture to get behind the paint and it will start to peel. So even if a gap is "paintable," caulk it.

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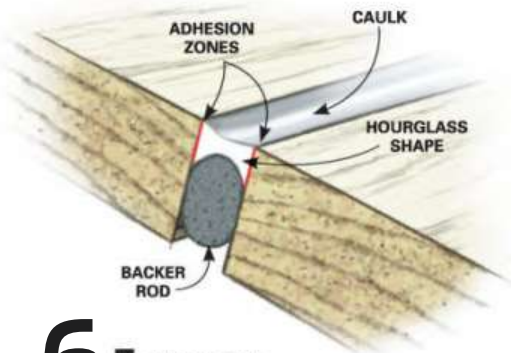
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6 Form an 'hourglass' bead

Gaps move. They constantly grow wider or narrower as the temperature and humidity change. A shrinking gap is the lesser problem; it just compresses the caulk. But when a gap widens, it puts a major strain on the seal. The caulk has to stretch without tearing in half or pulling away from the surrounding surface.

To prevent those failures, you want a bead that stretches easily in the middle and sticks stubbornly along the edges. An hourglass-shape bead accomplishes both of those goals. It stretches easily because it's thin in the middle and sticks well because it has wide "adhesion zones" along the edges. Backer rod makes a perfect hourglass bead easy (more on that in Tip 9). In situations where you're not using backer rod, a perfect bead may be easy, difficult or impossible. But use it whenever you can—you'll get a seal that will last much longer.



7 'Tool' the caulk

Smoothing a caulk bead with your finger doesn't just make it look neater. It also shapes the bead to withstand movement better (see Tip 4). With acrylic caulk, most of us simply moisten a finger and smooth the bead. With polyurethane, slip on a latex surgical-style glove and dip your finger in mineral spirits. If the gap is too wide to tool with your finger, try a plastic spoon.

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8 Fill hidden holes

In some ways, caulk is a better filler for nail and screw holes than fillers that are formulated for that purpose. It goes on fast, and unlike fillers that harden, it won't crack or fall out. The trouble with caulk is that it doesn't look as good as filler. It can't be sanded smooth, and it shrinks as it cures, leaving a slight depression over the hole.



9 Use backer rod

Foam backer rod is cheap and easy to use, and it can add years to the life of a caulk joint. Just stuff it into a gap before caulking and you'll automatically get the ideal seal (thin in the middle, with thicker "adhesion zones" at edges). Always use it on joints wider than 1/4 in. You can also use it on narrower gaps, but you may have trouble finding backer rod that's thin enough for small gaps. Buy rod that's 1/8 to 1/4 in. larger than the gap, and expect to pay less than \$5 for 20 ft. at home centers.



10 Get a perfect bead on concrete

On horizontal concrete, you can skip the tooling mess and get a perfect bead by using a self-leveling polyurethane sealant. Just insert backer rod and inject the syrupy sealant. Resist the urge to tool the caulk; it will slowly level out and form a neat seal. Be sure the backer rod completely seals the crack. If the caulk seeps past the rod, you'll get an ugly sinkhole and a weaker seal, and you'll waste expensive caulk (\$8 for a 10-oz. tube).

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CAR + garage

BY RICK MUSCOPLAT

editors@thefamilyhandyman.com



GETTY IMAGES/ECHO

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Here's a quote from a friend of mine who owns two car dealerships: "These days we get two kinds of new-car and truck buyers: those who do their homework by researching our costs online before walking in the door, and those who walk in cold. The buyers who do their research end up paying close to our invoice cost, get the best

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2. Check out the dealer's invoice cost and selling price

Head next to edmunds.com, truecar.com or consumerreports.org. (Edmunds and TrueCar are free, and Consumer Reports costs \$30 for a one-year membership.) Enter the model, trim and option package you want, along with your zip code. Then get a report showing the retail price, dealer's invoice cost, and what most people in your area are paying for that vehicle.



3. Discover your existing car's trade-in value

Go to nada.com and kbb.com. Enter your vehicle's information on both sites and get the values for trade-in and selling it yourself. Here's a tip: No vehicle is in "excellent condition" if it has scratches, stains or any signs of wear. "Excellent" means *flawless*. So be realistic when rating your car's condition.



4. Check out other financing options

Contact your bank, credit union and even your credit card company to find its best rate and term lengths for new car financing. You'll be offered financing at the dealership, so it would be wise to know your options before getting there.



5. Get competitive bids on aftermarket options

Dealers make a huge profit on add-ons like an extended warranty, paint protection film, floor mats and fabric protection. Get competitive quotes on all those add-ons from online retailers. For example, if you want a factory extended warranty, search for "Ford OEM extended warranty," and you'll get dozens of listings from Ford dealers around the country that are willing to sell you a genuine Ford extended warranty at a discount. Do the same for accessory add-ons like floor and cargo mats and bumper guards. If you want items like paint protection film, bed liner or paint sealant, get quotes from local vendors.

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BONUS BUYING TIPS

1

Don't buy from a dealer simply because you're offered free lifetime oil changes. Those "free" services may require you to have all your maintenance done at that dealer. And the dealer's list of (often costly) "recommended" services may not match or even be part of the carmaker's maintenance schedule.

2

If you made only a small down payment on your new vehicle, it's very smart to buy "gap insurance" to cover the difference between what you owe and what you'll get if the car is wrecked in the near future. That's especially true if the new car is putting you under any financial strain. Get quotes on gap insurance from your car insurance agent before you go to the dealer. Dealer gap insurance prices can be two to three times higher than the ones your agent may offer.

THEN CHOOSE A BUYING STYLE THAT FITS YOUR PERSONALITY

Many people hate negotiating the price of a new car and are willing to pay a bit more if they can avoid the stressful high-pressure sales tactics sometimes employed by dealers. But other people love the thrill of arm wrestling to get a rock-bottom price. Here are buying tips for both types of buyers.

A

The 'pay more, stress less' method

If you want the least stressful buying experience and are willing to pay about \$200 more to avoid the worst part of the car-buying experience, here are two options:

1 Check out the car-buying services offered by a credit union, wholesale club (Sam's Club, Costco, etc.), road service (AAA), car insurance company, professional association or local car-buying brokerage service. These services locate the car you want and get you a locked-in price. You show up at the dealer, check out the car and sign on the dotted line. You still have to negotiate the value of your trade-in and work with the dealer's finance department, but at least the vehicle price is established.

2 Choose the car or truck you want on edmunds.com or truecar.com and request a VIN (vehicle identification number) email quote from local dealers. A VIN quote is for a particular car already sitting on the dealer's lot. The dealer quotes will list the vehicle's color, factory- and dealer-installed options and the dealer's best price. Just pick the best offer. If you want the vehicle, act fast—it may sell quickly.

B

The 'fight-for-the-last-dime' method

Using the dealer cost information from edmunds.com or truecar.com, call the dealer and ask for the Internet sales manager. Let the dealer know you already checked out its cost on edmunds.com or truecar.com. Then ask the dealer to find the vehicle you want. Once the vehicle has been located, offer the dealer invoice cost. They won't accept your first offer—that's when the games begin. The dealer will usually counter with a minimal discount off the full retail price. Ignore that offer and follow these rules to get the best deal:

1 Negotiate up from the dealer's *invoice cost* by raising your offer in \$50 increments, and reject offers to "split the difference."

2 If you can't reach the deal you want on your first color choice, choose a less popular color and start the negotiations anew. Let the Internet sales manager know that the new color isn't your first choice, but if you can get a super deal, you might buy it.

3 If the vehicle has dealer-installed options you don't want, like paint protection film, undercoating, etc., tell the dealer you don't want them. The options won't be removed, so your goal is to pay as little as possible for them or choose a vehicle without them. Simply add up the retail cost for all the unwanted options and divide by two to arrive at their cost. Add that amount to the dealer invoice and make your offer.

If you've negotiated the price of the new vehicle by phone or email, get the terms in writing (in an email) before you head off to the dealer. Then drive your trade-in to the dealer, present a printout of the used-car valuation research you've done. Ask the salesperson to beat (or at least meet) that price for your trade-in.



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THEN CLOSE THE ENTIRE DEAL



The deal comes together in the finance department. If you're financing the purchase, ask the finance people if they can beat the interest rates and term quotes you got from your research. Then ask them to beat the Internet price quotes you got for an extended warranty and local vendors' prices for other add-ons.

Before you sign the papers, double-check the agreed-upon sale and trade-in prices, interest rate and loan terms. Reject any additional charges like dealer preparation. Don't rely on verbal assurances.

PRO tips

BY MARK PETERSEN

editors@thefamilyhandyman.com

Rough-in wiring

Whether your project is finishing a garage or a basement or building an addition, it's important to get the rough-in wiring done right the first time. We talked with several pros and got advice on drilling holes, installing boxes and pulling cable. With these tips in hand, you'll work faster, avoid disasters down the road and put a smile on the face of your electrical inspector.





INSTALL THE RIGHT BOX

Either plastic or fiberglass boxes will do the job, and each is completely code compliant. Some electricians prefer fiberglass ones because they're tougher, but others prefer the plastic ones because they're cheaper.

Whatever style you choose, pick box sizes that have a volume of at least 20 cu. in. Dimmer switches and other smart devices are common these days and take up more room in the box than the simple devices of the past. Plus, bigger boxes just make wiring easier, especially if they're crammed full of wires and connectors. Boxes destined for exterior walls and ceilings must be equipped with a vapor barrier seal.

Use the proper cable

Wire gauge	Amps	Uses
14	15	Common living spaces
12	20	Kitchens and bathrooms
10 and up	40-plus	Large appliances

Use special staples for stacking cable

Staples (and drilled holes) need to be at least 1-1/4 in. away from the edge of a framing member. In

some cases, that means stacking wires on top of one another and using one staple to secure them. Most standard staples can handle two wires. Never install staples over multiple wires unless the staple is approved for it. The staple package should list how many wires it's rated for. The staple shown here is good for up to four wires.



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AUGER BITS AND ANGLE DRILLS WORK BEST

A 3/4-in. spade bit will work OK for drilling the holes, but auger bits drill faster and require less effort. Choose a bit like this Milwaukee ship auger bit (\$13) that will chew through nails. It's easier to drill straight holes through the studs with a right-angle drill. Right-angle drills rent for \$25 per day, or you could buy an angle attachment for your own drill for about \$30.



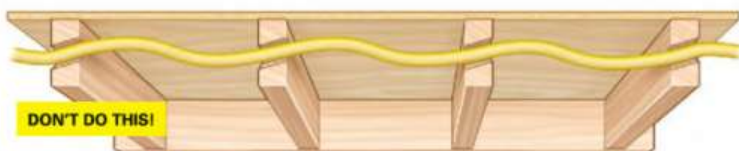
Install plates before pulling wire

Electrical cables need to be set back 1-1/4 in. or more from the edge of a stud or wood-framing member to protect cables from wayward nails and screws. Install steel cable-protection plates over holes drilled closer to the edge. Keep several plates in your pouch while you're drilling and install them right away so you don't forget.



Drill straight aligned holes

Keep the holes straight and at the same height. Pulling cable through several consecutive holes drilled at different angles or heights is difficult because the cable will snag on the sharp edges and fight you the whole time! Straight, aligned holes make pulling cable a breeze.



Pull cable from the middle

Don't rip open the plastic wrapper on your spool of cable. Instead, lift a handful of coils from the center of the roll and lay them on the floor. Four loops equals about 12 ft. Following this method helps reduce tangles and keeps the cable contained for easier transporting and storage. If you plan to use all of the cable, just neatly unroll the entire spool across the floor (as if it were a garden hose) to avoid kinks, curls or twists in the cable.



Avoid exposed open spaces

The electrical code doesn't allow exposed wires in open spaces. When cable is installed in exposed areas such as a garage or an unfinished basement, it needs to closely follow the framing members. Cables that span stud spaces or ceiling joists are in constant jeopardy of nicks and cuts, and it's too tempting to use the cables for tucking, hanging or trapping all kinds of toys and tools.



STRAIGHTEN BEFORE PULLING

Pulling cable through holes in framing is a lot easier if you straighten out the cable first. Walk along the length of the cable, straightening it between your thumb and forefinger as you go.

Once you've pulled the cable through the holes, push it back a bit to leave a small amount of slack. This is handy insurance in case you cut the cable a little short and need extra length, and it also allows other tradespeople a little slack to push your cable out of the way of plumbing pipes or ductwork.

Don't overbend the cable

Sharp bends in cable can damage the sheathing and the conductors, which could lead to a fire hazard. Cable should not be bent at more than a 2-1/2-in. radius (about the same as a soda can). Avoid overbending it by drilling holes 8 to 12 in. above (or below) the boxes so the cable can sweep down or up into the boxes. And never pull hard on cable that has a staple on the other end.



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Mark box locations first

Before you drill any holes, go around the room and mark the locations for all the outlet, light and switch boxes. Install the switches 42 in. up from the floor (to the bottom of the box), and the outlets up 12 to 16 in. These are typical heights used by pros. But actually, there's no height requirement. The important thing is to make all box heights consistent. Many pros use the length of their hammer as a guide to mark the location for the bottom of outlets.

The National Electrical Code requires outlets to be spaced within 12 ft. of each other. The idea is that every appliance, lamp or device is always within 6 ft. of an outlet.



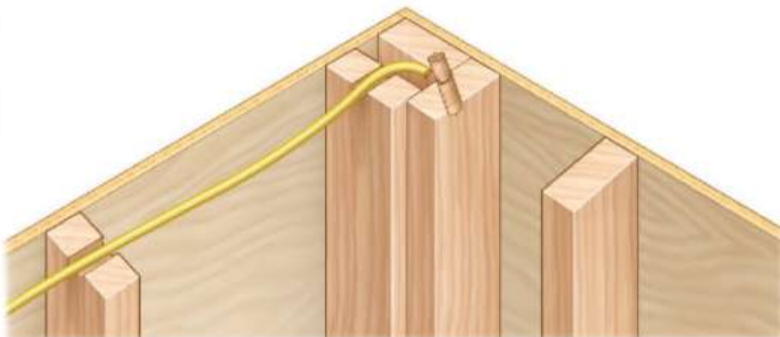
Ceiling fans need special boxes

A regular round electrical box isn't sturdy enough to support the weight and absorb the vibration of a ceiling fan. Special ceiling fan electrical boxes usually have an additional brace to stabilize the spinning fan. These types of boxes are a heck of a lot easier to install before the drywall is up, so even if there's a small chance that you'll replace the light with a fan sometime down the road, avoid headaches and spend a couple extra bucks on a fan box.



Strip off the sheathing

It's easier to strip the sheathing from the cables out in the open before they get shoved into the box. Remember to leave at least 1/4 in. of sheathing visible inside the box. If there's only one cable entering a box, install it through the knockout farthest from the stud.



Angle into corners

There's often not enough room to drill straight into an inside corner from both sides. This is one time when you'll have to drill into the stud at an angle. Fishing the cable through will be easier if you keep the holes at the same height. Sometimes it's not possible to fish a cable through a corner. In those cases, drill up through the double top plate of the wall, and route the cable up over the corner and down the other side.

PRO talk

BY MARK PETERSEN

editors@thefamilyhandyman.com

PRO GOOF FOOTWEAR FIASCO

As a siding contractor living in Minnesota, I learned how to dress for cold weather. On super-cold days, I would wear my

LaCrosse boots that are rated for temps as low as minus 70 degrees F, or something preposterous like that.

The boots did a great job of keeping my feet warm. The downside is size—they're enormous, especially the size 13 monsters I wear.

At the end of one particularly frigid day's work, I was turning my truck around to back into my shop, and I hit what I thought were the brakes. My truck didn't stop! The driveway was icy, so I wasn't surprised at first, but I got a little worried when the harder I pressed on the brakes, the faster my truck moved forward. About the time I realized that my boots were pressing on both the brake and accelerator pedals, I had crashed over my retaining wall. From then on, I wore regular shoes to and from work.

Mark Petersen, Associate Editor



MARK PETERSEN

PROJECT I'M PROUD OF

Reclaimed barn wood is popular but fussy

Reclaimed lumber has recently become a popular request from our clients. It's great to work with if you have the patience (and budget). The client on this project wanted to spruce up the existing posts and beams with reclaimed wood. Here's how I did it:

I bought the wood from a supplier that kiln-dries it and treats it for insects. I straightened the edges with a jointer and ripped the boards down into a few different widths. One side of every board was then planed so they were all the same thickness. I let the wood acclimate to the room for three days, then I attached it with construction adhesive and 16-gauge finish nails.

Here are a few extra steps to help you achieve the "wow" factor. Paint the substrate black so it doesn't show through knotholes and other flaws. Go easy on the adhesive, and don't wipe off the excess that squeezes out; wait until it dries and scrape it off. Miter all the outside corners, because a freshly sawn edge will look out of place next to the beautiful texture of the weathered wood. I finish by rounding all the mitered edges with the shaft of a screwdriver to close any gaps and soften the look a bit.

Josh Risberg, JKath Design, Build, Invent



JOSH RISBERG

TIP FROM A FELLOW PRO



HSP

Build a junk station

When you first show up at a job, set up a junk station using a pair of sawhorses and a piece of plywood. You'll have a central location for your tools, fasteners, chargers, radio, beverages, microwave and other necessities. This will save you time, reduce tripping hazards and make end-of-day cleanup a breeze.

Jeff Gorton, Associate Editor

Got something for us?

If you've got a tip, a brag photo or a project you'd like to share with fellow pros, send it to us at editors@thefamilyhandyman.com. We pay \$100 for each one we publish.

DIY Quiz

BY MARK PETERSEN

editors@thefamilyhandyman.com

Put on your thinking cap and take this month's quiz to see just how smart you are when it comes to DIY. Here's how it works:

- There are easy, intermediate and really tough questions all mixed together.
- There may be more than one correct answer!
- The answers begin on p. 82. Get your DIY rating on p. 91. Good luck!

1. True or False? When you're replacing a light fixture with a ceiling fan, it's necessary to use longer screws in the existing round plastic box to deal with the extra weight and vibration.

2. Your project calls for No. 8-32 machine screws. What does the "32" represent?

- A. Diameter of the screw
- B. Hardness of the metal
- C. Number of threads per inch
- D. Length of the screw

3. What is this tool used for?

- A. Slicing tiny pizzas
- B. Installing window and door screens
- C. Scoring wallpaper
- D. Cleaning grout



5. True or False? The terms "plumb" and "level" are interchangeable.

4. Where would you find this in your house?

- A. In the basement
- B. Under in-floor heating
- C. In the attic
- D. Inside an exterior wall



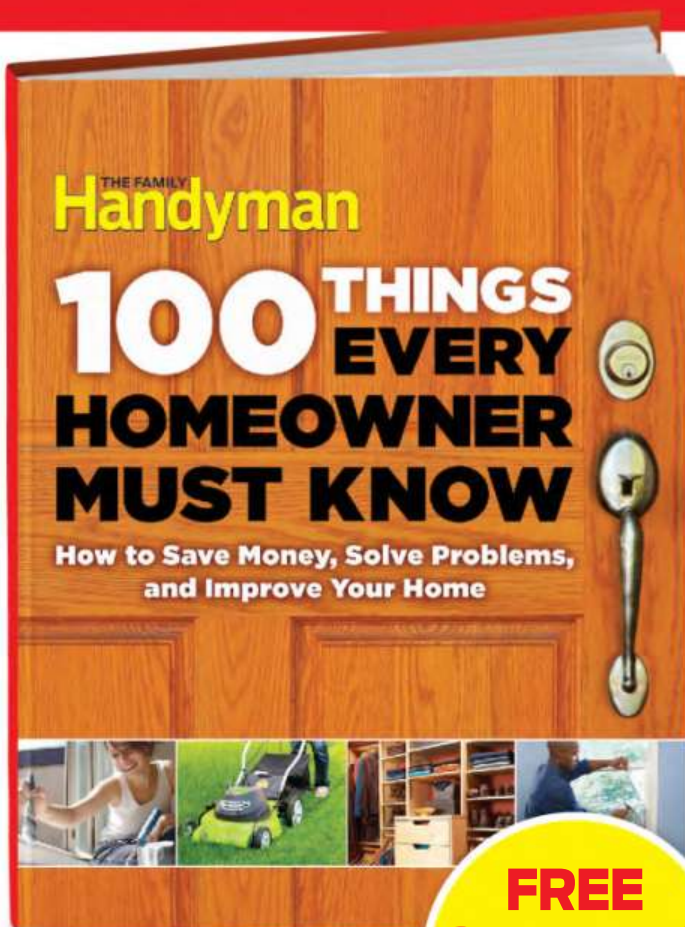
6. How can you tell if your car's air filter needs changing?

- A. See how much light shines through it.
- B. Determine whether it smells like gas.
- C. Check whether it feels oily to the touch.
- D. Change it every 5,000 miles regardless.



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7. What's the purpose of the small holes at the bottom of vinyl sliding windows?

- A. They let air in.
- B. They let bugs in.
- C. They're only necessary for installation and should be sealed with caulk when the job is complete.
- D. They let water out.

8. True or False? Lightning strikes are the only cause of power surges.



9. What do the colored handles (green, red and yellow) on aviation snips indicate?

- A. The thickness of the material they can cut.
- B. Which direction they cut best.
- C. Which materials they can cut.
- D. None of the above.



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10. What does an arc fault circuit interrupter (AFCI) do?

- A. Protects you from electrocution.
- B. Protects your electronics from electrical surges.
- C. Reduces your electricity usage.
- D. Protects your house from fire.

11. When should you install IC-rated recessed light housings (cans)?

- A. If you plan to use LED bulbs.
- B. If the housings will be covered by insulation.
- C. If people will be walking on the floor above.
- D. If the ceiling height is lower than 7-1/2 ft.



12. True or False? The arbors on most miter saws have reverse threads.

13. What's the best way to cut sharp turns with a jigsaw?

- A. Install a narrower blade.
- B. Make relief cuts.
- C. Install a wider blade.
- D. Push harder.

14. What are the advantages of using primer?

- A. It provides better adhesion.
- B. It blocks stains.
- C. It can save you money.
- D. All of the above.

15. For cool-season grasses like Kentucky bluegrass, when is the best time to aerate your lawn?

- A. Early spring.
- B. Late fall.
- C. When the grass is most hearty.
- D. When the grass is dormant.



Find the DIY Quiz answers on pp. 82, 83 and 91.



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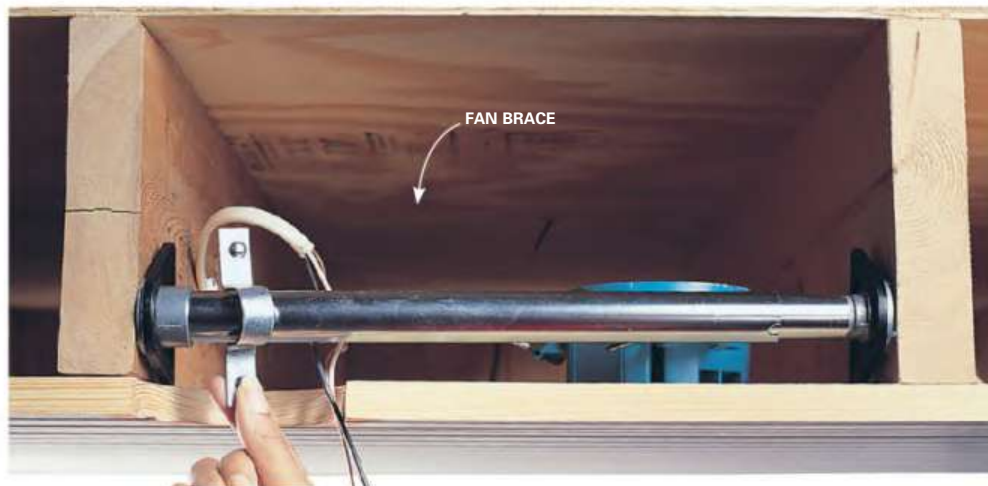
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DIY Quiz Answers

1. False. Few conventional boxes are strong enough to support a ceiling fan, so don't even think about trying to hang your fan from an existing box. Instead, buy a fan brace when you purchase your fan. You can choose braces that fasten with screws if the framing is accessible from the attic or if it's new construction. Otherwise, pick a brace that's designed to slip through the ceiling hole and through the electrical box. These braces adjust to fit between the framing members in your ceiling; you simply rotate the shaft to anchor them to the framing. Bust out the old box with a hammer.



2. (C) This is the number of threads per inch of screw shaft. The first number, in this case the 8, indicates the diameter of the screw shaft. And don't ask us why they're called screws when they look like little bolts.

3. (B) A spline roller is used to embed the rubber splines that hold screens into the



Less Pees, More Zzz's...

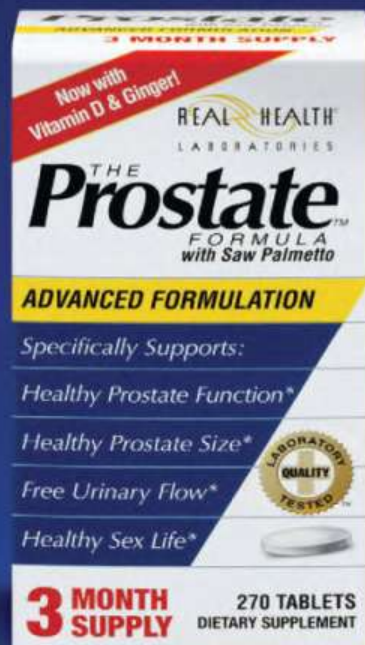
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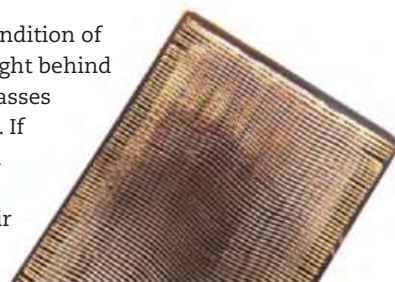


5. False. "Level" refers to something perfectly parallel with the surface of the earth (if the earth were flat). "Plumb" refers to something perfectly perpendicular to the surface of the earth. Here's a good way to think about it: A marble won't roll off a level shelf, and the leaning Tower of Pisa is a great example of a building that's out of plumb.



4. (C) Ideally, the temperature in your attic should be as close to the outside temperature as possible, so the more ventilation the better. Insulation chutes prevent attic insulation from squishing up against the roof decking and blocking the soffit vents that cool the attic.

6. (A) To test the true condition of your filter, hold a shop light behind it. See how much light passes through the inner pleats. If yours looks like this, you should change it sooner rather than later. Most air filters last for about 12,000 miles.



Continued on p. 91

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12. For Pocket Door Hardware, visit **johnsonhardware.com**, call **800-837-5664**, or follow on Twitter **@JohnsonHrdware**.



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- 21.  greenworks** The G-24 24V DigiPro Brushless Cordless 2-Speed Compact Drill includes (2) 2Ah batteries, one 24V battery charger, 2-sided bit, carrying bag, belt hook and detachable auxiliary handle. greenworkstools.com

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- 28.  CALCULATED INDUSTRIES** Calculated Industries' newest calculator for Do-It-Yourselfers is the Home Project Calc. It will help you save time, money and eliminate errors on your home improvement projects. Get the tool that will make sure you do it right the first time. calculated.com **1-800-854-8075**

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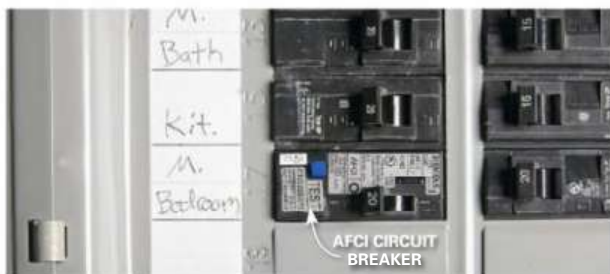
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7. (D) Weep holes are designed to let water out of the track that the sashes slide in. These holes should be checked and cleaned at least once a year. Inspect the weep holes by pouring water into the track to see if it flows freely out of the holes. If not, stick a pipe cleaner or hanger up into the hole to loosen the debris. Vacuum the tracks periodically to keep the weep holes from plugging. Never caulk over a weep hole!

8. False. Power surges can also occur when the power company switches grids and when air conditioners and other appliances equipped with large electric motors turn on and off. Safeguard your electronics with surge protectors.

9. (B) Compound snips, also called “aviation snips,” are color-coded to indicate which direction they cut best. Each snips can cut in any direction but excels at just one. Green snips (right-cut) are designed to cut clockwise curves. Red snips (left-cut) are designed to cut counter-clockwise curves. Yellow snips work best on straight cuts.



10. (D) AFCI circuit breakers and receptacles are designed to detect dangerous, abnormal arcing in branch circuits (touching wires in a frayed cord) and cut off the power to the circuit before a fire starts. Newer electrical codes require AFCI protection for all branch circuits supplying receptacles, switches, light fixtures, smoke detectors, etc., in most locations in your home.

11. (B) IC stands for “Insulation Contact.” IC housings have a heat shield that protects the material above them. If you cover a non-IC-rated light housing with insulation, heat from the light could start a fire.

12. True. Forget about “righty-tighty-lefty-loosey” when you’re changing your miter saw blade. Just like the lug nuts on the driver’s side of some 1962 Pontiacs, the arbors on most miter saws have reverse threads. Saw makers do this so the spinning blade doesn’t loosen the retaining nut. Why Pontiac did it, no one knows for sure.



13. (A & B) There’s a limit to how sharp a curve a jigsaw can cut. If you try to force the blade into a turn tighter than it’s capable of, you’ll either veer off your line or break the blade. The narrower the blade, the sharper the turns it can make. If you’re not sure about a particular shape, mark it out on a scrap and practice on that. If you have a curve you know is too tight, make relief cuts. The sharper the curve, the more relief cuts you’ll need.

14. (D) Primer adheres better than paint to all sorts of surfaces, such as raw wood, metal and other paint. Some primers are specifically formulated to cover stains that will bleed through regular paint. Also, primer is cheaper than paint, as low as \$10 per gallon compared with \$30 for a gallon of paint. Make sure to have your primer tinted a color similar to that of your paint, so you can get your project done in only two coats.

15. (C) The best time to aerate any lawn is when the grass is most hearty. For cool-season grasses, that’s early fall, about four weeks before the trees lose their leaves. Aerate warm-season grasses in late spring.

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RAINDROPS KEEP FALLING . . .

After I left for college, my father decided to empty my water bed. Unable to get a good siphon going, he gave up and dropped the hose on the floor and left the room to take care of other chores. Hours later he noticed water dripping through the ceiling below. The siphoning had started after all. When I went home that weekend, I saw several garbage cans in the living room. He had drilled holes all over the ceiling to let the water out. Poor Dad. I'd never seen him more frustrated or forlorn. I don't think we'll be shopping for another water bed anytime soon!

Karin Carr



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DIY TIP GENIUS

Doggone it

I was building a doghouse for my son-in-law's dog in my compact 8 x 12-ft. workshop. Everything went fine till it was time to take it outside and paint it. I tried to get it out the door front-to-back, then side-to-side, then flipped it top-to-bottom, but it was still a couple of inches too wide. After all this work, I wasn't about to dismantle this fabulous project. Two hours later, I finally got it outside—after removing the trim, the door and the door frame!

Carlos Quintero



Dim and dimmer

One day as I was cleaning the house, the vacuum lost power. Thinking there was something wrong with it, I asked my husband (a licensed electrician) to help me figure it out. He unplugged the vacuum, took it apart, cleaned it and put it back together, but it still didn't work properly. As he examined the problem, I turned up the wall dimmer switch that controlled the floor lamp and all of a sudden the vacuum worked perfectly. Turns out I had plugged the vacuum into the same receptacle that powered the lamp—the one controlled by the dimmer switch. We both laughed it off, feeling a bit foolish that our own "lightbulbs" seemed to be on a dimmer switch that day.

Emily Alexander

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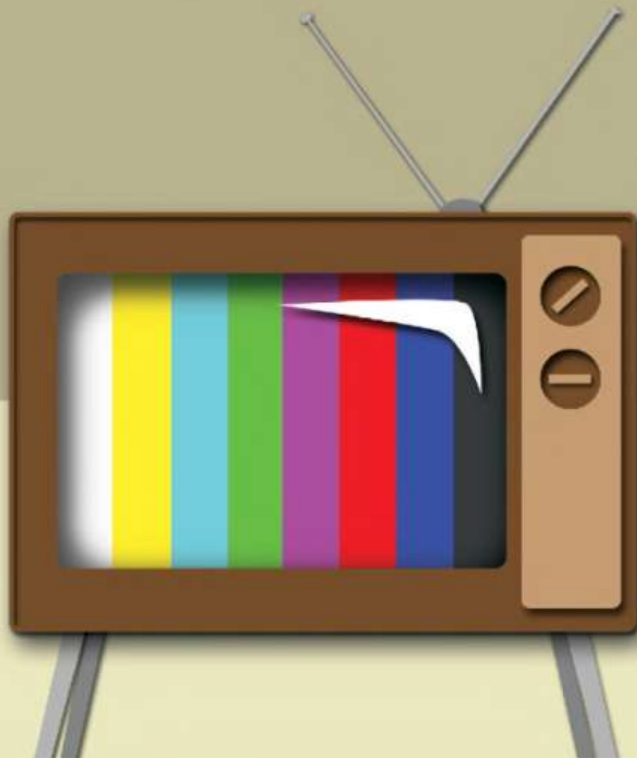
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